

# South African Medical Journal

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Weekly 2s

### PHYSIOLOGY OF MICTURITION AND EJACULATION \*

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The excuse to do investigations of a research nature does not often present itself in clinical practice, so that one does not feel obliged to apologise in presenting a small number of cases. However, since most of the knowledge of the physiology of the bladder is based on animal experiments, it is important to check these accepted facts on human patients when the opportunity presents itself.

The bladder and posterior urethra receive a parasympathetic nerve supply via the nervi erigentes from second, third and fourth sacral nerves, and sympathetic nerves via the presacral nerve (or plexus) from the sympathetic trunk and the aortic plexus. The pudendal nerve provides somatic nerve fibres to the posterior urethra and the region of the bladder sphincters. The peritoneal surface of the bladder probably also receives nerve fibres from the lower intercostal and the iliohypogastric nerves. With this nerve supply, the bladder is able to function efficiently as a hollow muscular organ acting as a reservoir for urine.

From the transitional-cell mucosal lining, sensory impulses of touch, pain and temperature arise, and the stretch reflex of the detrusor muscle gives rise to the feeling of filling. Efferent motor fibres cause contraction of the detrusor and emptying of the viscus; this last function is a voluntary one in adults, and the urinary stream can also be cut off almost instantaneously by willed contraction of the external bladder sphincter.

There are several theories regarding the manner in which voluntary micturition is initiated, and maintained, and considerable controversy rages about the role played by the different nerves and the bladder sphincters.

I propose to state certain accepted facts, and then to examine these facts in the light of clinical investigation.

It is stated that the parasympathetic nerve supply of the bladder is all-important. When it is intact, micturition is perfect. It carries sensory impulses from the mucosa and muscle of the bladder which reflexly mediate motor impulses to the detrusor. This reflex arc centres in the sacral area of the cord and is under both subconscious and voluntary control from higher brain centres.

Much experimental work has gone to prove the validity of this concept, and numerous clinical records

can be brought to mind which substantiate this claim. It is known, for instance, that lesions of the conus area of the cord, or of the cauda equina, or of the pelvic nerves, result in a severely crippled bladder of the atonic or autonomous type. The bladder is completely insensitive and the detrusor paralysed. There may be some local tone due to intra-mural nervous connections, but these patients have a high residual urine and overflow incontinence, or at best are able to empty the bladder reasonably well by abdominal contraction. It is thus a fact, supported by experimental and clinical evidence, that the all-important nerve supply for micturition is the parasympathetic.

At this stage it will be convenient to describe the methods employed in testing bladder function.

Considerable information can be had from cystometry, which is simply a record of the detrusor's reaction to bladder filling. A cystometrogram should be regarded as any other test of a spinal reflex, and may be likened to the ankle and knee jerk. I have found the method advised by McLellan to be very satisfactory and simple. He uses a water cystometer and records the following:

a. Sensation—this is the feeling which a normal subject gets as the bladder fills. It may be absent, diminished, or present.

b. First desire—the patient tells the examiner at which stage of the experiment he first gets a desire to void. This is expressed as a volume of fluid.

c. Capacity—this is the amount of fluid encompassed by the bladder at the time of 'uncomfortable fullness'.

d. Pressure Curve—this is the curve which would be traced by any of the recording cystometers. Here it is obtained by plotting on a graph the corresponding manometer readings opposite the volume of fluid in the bladder.

e. Uninhibited Contractions—there are contractions of the detrusor muscle which cause a rise in the manometer fluid. They are recorded as vertical lines rising from the pressure curve. These detrusor contractions are involuntary, and are not found in the normal bladder.

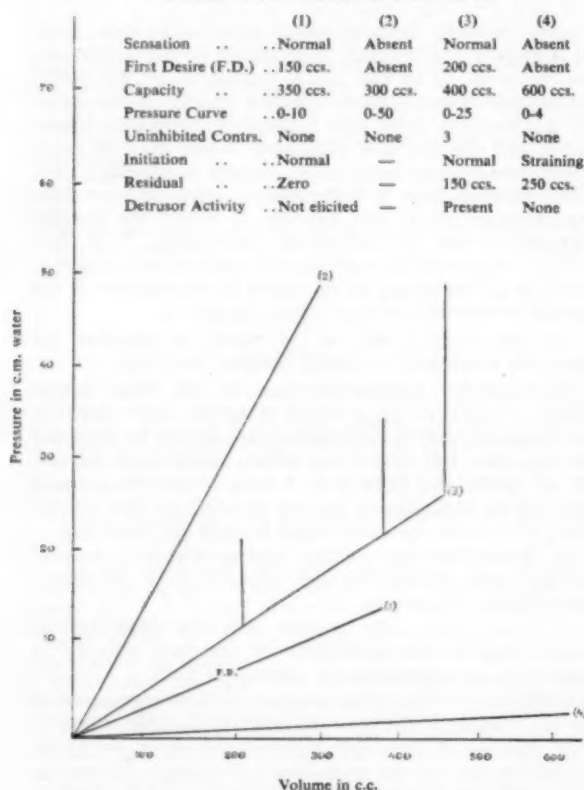
f. Initiation—this refers to the method of voiding urine. The information is got from watching the patient void, or by interrogation. Its chief purpose is to see if the detrusor is working, or if the bladder is emptied by the abdominal muscles.

\* This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.

g. Residual Urine—this is measured at the commencement of the test.

h. Detrusor Activity—McLellan does not specify this as a separate observation. It is mentioned by Band. When the bladder is almost full, the patient is told to try and void. Detrusor activity results in a smooth steady rise and subsequent slow fall of the pressure, which distinguishes it from the sharp rise and fall of abdominal wall contraction. Absence of detrusor contraction may be due to a paralysed bladder or nervous discomfort of the patient. It is frequently not elicited in normal bladders, but it is pleasing to see when it is present.

#### TYPE CYSTOMETROGRAMS



Four cystometric records—(1) Normal. (2) Under spinal anaesthesia. (3) Uninhibited neurogenic bladder cervical chordotomy. (4) Atonic bladder of tabes dorsalis.

A cystometric reading can easily be made at the time of cystoscopy by connecting a burette to the outlet valve of the cystoscope; the inlet water valve is used for making the increments of fluid into the bladder.

The sensation of the bladder can be tested in several ways. First, there is the sense of filling and the desire to urinate, which in normal bladders, is apparent at about 150 c.c. The bladder mucosa can also distinguish between hot and cold, the critical temperatures after several normals had been taken was found to be 68°C.

for 'cool' and 100°C. for 'warm'. However, it was found to be more practical to use fluid at 60°C. and 110°C., which temperatures could distinctively be appreciated as 'cold' or 'hot' respectively.

Although the bladder mucosa is sensitive to touch, this response was so variable in a series of controls, that its use as a routine test is unreliable. The mucosa has usually to be dimpled by the examining bougie or electrode before sensation is definite. On the other hand, passage of a bougie into the urethral meatus is usually distinctly felt. By using a Hinsey-Geohegan stimulator, a stimulus of known intensity can be given and so comparisons can be made. One volt stimulation can just be felt on the tip of the tongue, and also on the trigone of the bladder. Five volts on the tongue is unpleasant, and in the bladder causes the patient a twinge of pain. The posterior urethra, and the lateral and posterior walls of the bladder are relatively less sensitive than the trigone area, and need 2-3 volts to be appreciated.

When these tests of sensation and detrusor activity are done on neurogenic bladders where the lesion affects the nervi erigentes, the sacral roots, the cauda equina, or the conus medullaris, the bladder is found to be completely insensitive to all stimuli, and the detrusor muscle is atonic or has a minor degree of tonus due to the intrinsic nerves in the bladder wall.

What do we know of the influence of the pudendal nerves on micturition? The pudendal nerve supplies the muscles of the perineum including the compressor urethrae, and probably also receives sensory impulses from the posterior urethra. It is considered that the voluntary control of micturition depends on the external sphincter being supplied by the pudendal nerve. Thus it is that the urinary stream can be cut off at will. Nevertheless, section of these nerves in experimental animals does not lead to marked urinary disorder. At most they become a little incontinent with stress.

Learmonth has recorded that in female patients section of the pudendal nerves hardly disturbs bladder function at all. The nerves have also been cut in male patients; the only resultant loss being inability to stop the urinary stream as before. Thus, for reasonably efficient micturition, the pudendal nerves are not indispensable, and the external sphincter is, as it were, a second line of defence in urinary continence. This is in keeping with the anatomical fact that the external sphincter is very poorly developed and impossible to demonstrate in the female human subject.

In both sexes urinary continence depends in the first place upon an adequate tone of the bladder neck or internal sphincter area. When this sphincter cannot function, as, for instance, after a prostatectomy, then the external sphincter area maintains continence. For this reason Emmett has described the external sphincter as semi-voluntary.

What role does the sympathetic nervous system play in micturition? The notion that the sympathetic has a completely opposite action on the bladder muscle and sphincter to the parasympathetic, has, in recent years, been questioned. Nevertheless, experimental work in animals suggests that sympathetic action inhibits the

detrusor, effects closure of the internal sphincter, and has afferent fibres which convey sensation of a special type from the bladder.

It seemed to me that patients who had undergone a Smithwick sympathectomy for hypertension, presented a fruitful field for investigation. The operation is usually done on healthy virile individuals with no complicating diseases to cloud the issue. The operation aims at removal of the sympathetic chain from the ninth thoracic ganglion to about the third lumbar ganglion, together with the splanchnic nerves. Since the lower level of sympathetic outflow is from the second lumbar nerve, such a bilateral operation removes all sympathetic supply from the bladder and pelvic organs.

Three cases were examined just before, and during the convalescence after, the sympathectomy. These patients noticed no difference in the act or frequency of micturition after the operation. The bladder sensations of filling, touch and electrical stimulation, and appreciation of temperature, showed no material difference when the pre- and post-operative findings were compared. The cystometrograms before and after were practically identical. Sympathectomy did not result in any appreciable cystoscopic change in the appearance of the bladder.

Seven further cases were investigated where the sympathectomy had been done for periods ranging from six months to several years. No change in the bladder could be found as regards sensation, cystometry, function, or cystoscopic appearance.

The inference is, therefore, that the bladder functions perfectly after all its sympathetic connections have been severed. If it were true that the sympathetic inhibits the detrusor, these post-sympathectomy bladders should have been more spastic, and the patients should have complained of increased frequency. Such was not the case.

But does the sympathetic convey certain sensations from the bladder? The experiments quoted above suggest that in the normal functioning bladder no ordinary sensations of touch, temperature, pain or fullness, travel via the sympathetic. Nevertheless, several authorities have recommended presacral neurectomy for severe bladder pain. Two cases presented themselves for exploration in this regard.

The first was a woman aged 65 who was cured of an epidermoid carcinoma of the bladder with radon seed implantation. She developed a distressing radon cystitis with marked frequency and purulent urine. Bladder capacity was 100 c.c. and distention above 75 c.c. caused marked pain. Caudal anaesthesia was given so that she became anaesthetic over the skin areas supplied by S1, 2, 3, 4 and 5. Distention of the bladder remained painful. The spinal nerves T11, 12, L1, 2 and 3, were blocked with novocaine in the intervertebral foramina. The pain of bladder distention was not relieved. She was then given a bilateral paravertebral block of the lumbar ganglia, 2, 3 and 4. Soon after, all the pain in the bladder area disappeared and the bladder could be distended painlessly to 125 c.c. She remained free of pain for four weeks. This procedure was repeated and she was once more rendered comfortable for a couple of weeks.

This case illustrates that the pain of a spastic bladder condition does indeed travel via the sympathetic, and that in this case it entered the spinal cord above T11.

Then there is the case of a man of 64 who had had the anterior and posterior nerve roots of S1, 2, 3 and 4, cut to relieve severe pain due to a chordoma of the sacrum. He became incontinent of urine and faeces, but was free of pain. On investigation it was found that his bladder was insensitive to heat or cold and light touch, but that he could feel an electrical stimulus of 5 volts. Distention of the bladder to 150 c.c. caused a vague pain in the hypogastrium. The sensation to an electrical stimulus (even up to 10 volts), and the discomfort caused by bladder distention disappeared entirely after a bilateral paravertebral lumbar block. This demonstrates that painful distention of a spastic bladder is felt by afferent nerves of the sympathetic nervous system. It is interesting to note that the discomfort of an electrical stimulus apparently takes the same route.

Two cases who had had thoraco-lumbar sympathectomies were each given a low spinal anaesthetic so that anaesthesia was confined to S1-S5. These bladders were now presumably without autonomic nervous innervation. On testing, it was found that both of them were completely insensitive to all the usual tests including distention. Even a stimulus of 10 volts caused no feeling, but interestingly enough, resulted in a smooth contraction of the detrusor which could be seen cystoscopically and was registered on the cystometer. This reaction was that of the autonomous bladder and must be due to the intrinsic nerves of the bladder wall.

One remaining supposed function of the sympathetic remains to be investigated, viz., the effect of causing closure of the internal bladder sphincter. Learmonth has claimed to have seen this cystoscopically when the distal end of the severed presacral nerve is stimulated. At the same time, he noticed clouds of prostatic and vesicular fluid being ejected into the posterior urethra. Animal experiments have shown that the ductus deferens and the seminal vesicles contract when the sympathetic nerves are stimulated. This sexual function of the sympathetic is regarded as its most important function, and it effects closure of the internal bladder sphincter at the moment of ejaculation, and so makes the posterior urethra temporarily a purely genital duct.

In order to investigate this aspect, eleven post-sympathectomy patients were examined. All were virile married men, and all had found no change in the act of micturition. Seven of these men said the sexual act was exactly similar to before the operation but they ejaculated no semen. Sensation of sexual orgasm was normal. Four of the men not only had normal orgasm but also ejaculated normally, and two of them had had children since the operation.

This data is of considerable interest. If one examines the chart showing the extent of the sympathectomy, one finds that the patients who retain the ability to ejaculate have had a less extensive sympathectomy. Where the second lumbar ganglion has been left intact on one or both sides, ejaculation is not affected. Similar



results have been found in the lumbar sympathectomy for Buerger's Disease where the second, third and fourth ganglia are removed. If the first ganglion is left intact, ejaculation remains intact.

It is especially the group who did not ejaculate who are of interest. Four of these seven patients were asked to bring along the specimen of urine passed after cohabitation. These urines all contained sperm, and several could be seen in the high power field in an uncentrifuged specimen. One patient submitted 800 c.c. which he said was one voiding. This urine contained approximately 500 million spermatozoa, which would represent a good count for a normal ejaculation.

This evidence suggests that these patients who do not ejaculate, do in fact have retrograde ejaculation

into the bladder, in the same way that post-prostatectomy patients do. If this is so, the role of the sympathetic in closing off the internal bladder sphincter during sexual congress is most important. It also follows that the motor fibres to the epididymis, the vas deferens, and the seminal vesicles, are not via the sympathetic route. Emptying of these organs is thus presumably effected by the parasympathetic nerves. Such a concept is against the present day teaching, and contrary to what has been observed in animal experiments.

It would appear to me that further experimental exploration is indicated before one can be dogmatic about some of these results, but I did feel it was of sufficient interest to form the basis of a preliminary report.

#### CHART OF PATIENTS EXAMINED

The sympathectomy was done in two stages (right and left). The date of the second stage is given.

No.	Age	Sex	Thoraco-Lumbar Sympathectomy	Post-Operative Findings
1	47	F	R T8—L4 L T8—L4 May 1946	Micturition normal.
2	38	M	R T8—L3 L T8—L3 July 1946	Micturition normal. No penile erections.
3	44	F	R T8—L4 L T8—L4 May 1946	Micturition normal.
4	42	M	R T8—L3 L T8—L3 February 1942	Organism normal, no ejaculate. Post-coital urine contains sperms.
5	37	M	R T8—L3 R T8—L3 November 1945	Ditto.
6	38	M	R T7—L4 L T8—L4 April 1946	Ditto.
7	28	F	R T8—L4 L T8—L4 March 1946	Micturition normal.
8	33	F	R T8—L3 L T8—L3 August 1945	Ditto.
9	56	F	R T8—L3 L T8—L4 May 1946	Frequency of urination. Hemiplegia.
10	22	M	R T9—L2 L T9—L3 February 1944	Organism normal, no ejaculate. Post-coital urine contains sperms.
11	37	M	R T9—L3 L T9—L3 June 1945	Organism normal, no ejaculate.
12	42	M	R T8—L3 L T8—L3 October 1945	Ditto.
13	48	M	R T9—L1 L T9—L1 February 1943	Normal orgasm, and ejaculate.
14	35	M	R T9—L1 L T9—L2 August 1943	Normal orgasm, and ejaculate. One child.
15	31	M	R T9—L1 L T9—L2 May 1942	Normal orgasm, and ejaculate. Two children.
16	48	M	R T9—L2 L T9—L3 February 1944	Normal orgasm, no ejaculate.
17	51	M	R T9—L2 L T9—L2 December 1943	Normal orgasm, and ejaculate. Sperm analysis excellent.

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# South African Medical Journal

## Suid-Afrikaanse Tydskrif vir Geneeskunde

### VAN DIE REDAKSIE

#### 'N NUWE NASIONALE INSTITUUT VIR MEDIESE NAVORSING

Hierdie aantreklike navorsingsentrum wat onlangs in Londen geopen is, sal ongeveer 100 deskundige wetenskaplike werkers huisves asook instandhoudings- en administratiewe personeel wat nog 250 sal beloop. Van die sentrale blok wat sewe verdiepings hoog is, loop daar twee groot vleuels uit wat elkeen drie verdiepings hoog is. Die eintlike werkruimte beslaan ongeveer 90,000 vierkante voet met laboratoriums op elk van die vernaamste verdiepings.

Dele van die geboue is spesiaal ontwerp vir navorsing waarby radio-aktiewe isotope gebruik word en die grootste ruimte is toegeken aan die afdeling wat met chemoterapie te doen het.

Gelykvloers is daar laboratoriums vir navorsing in verband met die probleme van organiese skeikunde en onmiddellik onder hierdie kamers is daar plek vir sulke bedrywighede soos mikro-ontleedkunde en hidro-genasies.

'n Spesiale insektarium is vir navorsing in verband met tropiese siektes gebou en die chemoterapie-afdeling is besig met 'n intensiewe ondersoek van malaria en filariase sowel as amebe-disenterie.

In die biologiese afdeling word eksperimentele werk gedoen wat parallel loop met die ondersoeke waarmee die chemoterapeute die nouste verbonde is.

#### WÊRELD-GRIEPSENTRUM

Een van die onderwerpe waarmee die Instituut hom die meeste besig hou, is navorsing in verband met die ongesteldhede wat deur die verskillende soorte virusse veroorsaak word en verskeie laboratoriums is spesiaal vir hierdie werk afgesonder.

Die *National Institute for Medical Research* is deur tradisie verbind met ondersoeke na die vraagstukke van griep en spesiale aandag sal voortdurend geskenk word aan die virussiektes wat die asemhalingstelsel waarvan griep die siekte is wat die meeste voorkom. Hierdie afdeling huisves ook die Wêreld-griepsentrum wat deur die *British Medical Research Council* vir die Wêreld-gesondheidsorganisasie bestuur word.

Die Departement van Biologiese Standaarde sal voortgaan om hoofsaaklik kwessies van bakteriologie en immunisering te behandel. Hierdie afdeling sal ook die spesiale koelkamer huisves wat die internasionale biologiese standaarde self sal bevat wat die grondslag

### EDITORIAL

#### A NEW NATIONAL INSTITUTE FOR MEDICAL RESEARCH

This fine research centre, recently opened in London, will house about 100 expert scientific workers as well as maintenance and administrative staff amounting to another 250. From the central block seven floors high there extend two large wings, each three storeys high. The actual working space covers some 90,000 square feet, with laboratories on each of the main floors.

Sections of the buildings have been specially designed for research employing radio-active isotopes, and the largest allocation of space has been given to the section dealing with chemotherapy.

On the ground floor there are laboratories for research into problems in organic chemistry and immediately below these rooms there is accommodation for such activities as micro-analysis and hydrogenations.

A special insectarium has been built for research into tropical diseases and the chemotherapy section is engaged in an intensive study of malaria and filariasis as well as amoebic dysentery.

In the biological section the experimental work carried out parallels the investigations with which the chemotherapists are most closely concerned.

#### WORLD INFLUENZA CENTRE

A subject which forms one of the Institute's major pre-occupations is research into the disorders produced by various kinds of viruses, and several laboratories have been set aside specially for this work.

The National Institute for Medical Research has long had a traditional association with investigations into the problems of influenza and special attention will continue to be paid to virus diseases of the respiratory system, of which influenza is one of the most prevalent. This section also houses the World Influenza Centre run by the British Medical Research Council for the World Health Organization.

The Department of Biological Standards will continue to deal mainly with questions of bacteriology and immunization. This section will also house the special cold room for accommodating the international biological standards themselves, which form the basis

van ons eie standaardiseringsprogram in hierdie land vorm en wat die instelling van die Regulasies in verband met Terapeutiese Stowwe ingevolge ons Wet op Geneeshere, Tendaartse en Aptekers moontlik maak.

Die afdeling in verband met die eksperimentele biologie het 'n trotse prestasieverlede op die gebied van die hormone-studie en sal nou sy georganiseerde aandag aan faktore in verband met vrugbaarheid en vetsug skenk. Die ondersoek wat op die oomblik aan die gang is, het 'n regstreekse verband met die probleme van kunsmatige bevrugting en die gebou hou 'n spesiale eksperimentele dierehuis en 'n klein teelkolonie vir sy eie werk daarop na.

#### MENSLIKE INGENIEURSWESE

'n Uitgewerkte program van ondersoek na die omstandighede in verband met die groei en ontwikkeling van bakterieë is deur die departement van kiemskeikunde onderneem.

Dit is deel van 'n skema in verband met die uitvoerige ondersoek van alles wat inligting mag oplever in verband met die wyse waarop die liggaam, wat as 'n menslike masjien beskou word, met die grootste gemak en doeltreffendheid kan funksioneer. 'n prominente rol in die Instituut se bedrywighede word deur elektrofisiologiese navorsing gespeel. Spesiale toerusting is vir hierdie werk geïnstalleer asook vir algemene fisiologiese en farmakologiese ondersoeke.

Ander buitengewone apparaat is geïnstalleer in kamers wat gewy is aan biofisika en oogkunde. Hierdie afdeling is verantwoordelik vir alle fisiese werk in verband met radio-aktiewe isotope wat in al die laboratoriums gebruik word. 'n Massa-spektrometer wat spesiaal binne die Instituut gebou is, sal gebruik word om die aard van die stabiele isotope te ontleed.

#### DIREKTEUR: SIR CHARLES HARINGTON

Sir Charles Harington is die Direkteur van die uitstekende nuwe sentrum vir navorsing in verband met die oorsake, die genesing en voorkoming van allerhande soorte siektes. Sir Charles is welbekend vir sy skitterende werk in verband met die skeikunde en fisiologie van die skildklier en onder sy sorg kan baie verwag word van die groot uitbreiding en bedrywighede wat onder beskerming van die *British Medical Research Council* staan.

Dit is belangwekkend om daarop te let dat hierdie Raad verlede jaar meer as £750,000 uitgegee het, vergeleke met £450,000 gedurende 1947.

'n Ander onderwerp waaraan baie aandag geskenk word, nie net in Brittanje nie, maar ook in baie ander dele van die wêreld, is die uitwerking van verskillende klimaatomstandighede en diëte op die menslike organisme. Dit uitslae van hierdie wydverrekte ondersoek en proefnemings word by die Instituut in Londen gekoördineer en is dus daadwerklik behulpsaam in die wêreldwye stryd teen siekte en ondervoeding.

Dit is miskien veral in verband met hierdie laaste bedrywighede dat ons in hierdie land 'n spesiale bydrae te make het en die bedrywighede van ons eie Raad vir Wetenskaplike en Nywerheidsnavorsing begin reeds bemoedigende resultate lewer.

of our own standardization programme in this country and have made possible the introduction of the Therapeutic Substances Regulations under our Medical, Dental and Pharmacy Act.

The division concerned with experimental biology has a proud record of achievement in the field of hormone study and will now give its organized attention to factors affecting fertility and obesity. The investigations at present under way have a direct bearing on the problems of artificial insemination and the building maintains a special experimental animal house and a small breeding colony for its own work.

#### HUMAN ENGINEERING

A planned programme of investigations into the conditions affecting the growth and development of bacteria has been undertaken by the department of bacterial chemistry.

This is part of a scheme which involves the detailed examination of everything which may yield information about how the body, regarded as a human engine, can function with the greatest ease and efficiency. A prominent part in the Institute's activities is played by electrophysiological research. Special equipment has been installed for this work as well as for general physiological and pharmacological studies.

Other unique apparatus has been fitted in rooms devoted to work in biophysics and optics. This section is responsible for all physical work on radio-active isotopes used in any of the laboratories. A mass spectrometer specially built in the Institute will be used for analysing the character of the stable isotopes.

#### DIRECTOR: SIR CHARLES HARINGTON

Sir Charles Harington is the Director of this magnificent new centre for research into the causes, the cure and the prevention of diseases of all kinds. Sir Charles is well known for his brilliant work on the chemistry and physiology of the thyroid gland and under his care much can be expected from the great expansion and activities sponsored by the British Medical Research Council.

It is interesting to note that this Council spent more than £750,000 last year compared with £450,000 during 1947.

Another subject to which much attention is now being paid, not only in Britain but also in many other parts of the world, is the effect of different climates and diets on the human organism. The results of these far-flung studies and experiments are being co-ordinated in the Institute in London and so assist materially in the world-wide struggle against disease and malnutrition.

It is perhaps particularly in relation to this last activity that we in this country have a special contribution to make, and the activities of our own Council for Scientific and Industrial Research are already beginning to show gratifying results.

## MYOCARDIAL INFARCTION

## SOME INDICATIONS IN PROGNOSIS

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In spite of increased technical aids in expert hands, prognosis in myocardial infarction has not, unfortunately, been rendered much easier. The electrocardiograph, precise and certain at most times, can, on occasion, when we most require its help, fail to help at the crucial moment. When our need is the sorest, the electrocardiogram may be unhelpful or even misleading. While we recognize its limitations we are grateful for the positive evidence it can provide in the great majority of instances; but there are times when we have to rely entirely on the clinical aspects of the case, which may be typical of coronary thrombosis and yet the E.C.G. fails to indicate the true state of myocardial damage.

We know this can occur in cases of limited thrombosis, where the lesion is entirely intramural, or where the thrombosis is not followed by infarction. However, in the great majority of cases we have unassailable and accurate evidence given us by an electrocardiogram which, although defining the site and extent of the damage, does not enable us to evaluate the probable outcome in terms of life or death. Electrocardiography, although essential for diagnosis, is uncertain for assessment. No close relation between clinical progress and E.C.G. changes can be demonstrated conclusively, although in patients who make a good clinical recovery a large number of tracings becomes normal. One man may die in his first attack while another may live on for 20 years or more.

Prognostically, cases of myocardial infarction may be divided into slight, moderate and severe, according to mode of onset, severity and duration of pain, degree of shock, fall of blood pressure and increase of sedimentation rate.

In the *slight coronary thrombosis* the prognosis is usually good, especially in a first attack, there is an absence of shock, pain is moderate, the B.S.R. may be normal and in three or four weeks the patient is well enough to get up. The E.C.G. in slight cases is often within normal limits, thereby casting a doubt on the clinical diagnosis.

In the *moderate attack*, the E.C.G. usually confirms the clinical diagnosis. Pain is severe and may require more than one injection of morphine to give relief. The pain may recur in a modified form, or an arrhythmia during the attack or later may give cause for anxiety; should the pulse rate rise to 90 per minute or over the prognosis must be more guarded. The B.S.R. is more pronounced and there is a rise of temperature. These cases are apt to be followed in a short while by a severe and more dangerous infarction.

*Severe coronary attack.* Here pain is very severe and may have been preceded by one or more attacks of angina pectoris. Rest in bed does not prevent the

second and more severe attack from developing and the pain of this may last 24 hours or longer and may require several doses of morphine to give even moderate ease. It is in these cases particularly that the 'hyperdoric' or delayed action morphine with atropine has its greatest use. These severe cases often show a marked arrhythmia, usually auricular fibrillation, and are followed by a ventricular tachycardia which further embarrasses the already over-burdened cardiac musculature and leads to congestive heart failure. The electrocardiogram in these cases clinches the clinical diagnosis, and the one grain of comfort it might convey is the intimation that the infarction is in the right and posterior coronary artery region. The collateral circulation here being more abundant, the outlook for the patient is less gloomy.

It must be emphasized that something like 70% of severe cases are fatal within the first 24 hours. Should there be no recurrence of infarction the outlook is somewhat better but in any case recurrence is unpredictable.

Statistics of coronary thrombosis among members of the American army during the recent war show a mortality of 78% amongst age groups 20-30 years. Newman (1946) reported on 50 cases of coronary occlusion in young British soldiers during the Second World War. Of these 39 were fatal, 33 dying suddenly, the diagnosis being verified at autopsy. These figures emphasize the fact that the younger the patient, the more fatal the disease.

On reviewing all degrees of coronary infarction we can arrive at something approaching accuracy of forecast by bearing in mind the following clinical signs as of grave import:

1. Heart sounds continuing feeble and distant.
2. Triple rhythm heard at the lower end of sternum.
3. Cardiac arrhythmia, of which the commonest is auricular fibrillation. Serial tracings may be helpful here.
4. Pulse rate of 90 per minute or over, continuing beyond the second day. This usually portends a further attack of thrombosis or of embolism.
5. Embolic symptoms.
6. Signs of congestive heart failure.

The prognosis will also greatly depend on whether the case is slight, moderate or severe, and whether it is a first attack. In the case of a first attack the prognosis is slightly more hopeful, whereas second or third attacks have a gloomier outlook. Even in slight attacks, if the pulse rate rises to 90 per minute or over, and stays there, the prognosis is more serious as further infarction or embolism can be expected. If these slight cases are followed by angina of effort it



indicates a state of coronary insufficiency and one liable and likely to be followed by a more severe attack. Cases with persistent tachycardia do not do well and in a week, two weeks or longer further infarction, embolism or congestive heart failure closes the scene.

Of equally serious import is the unusual case with bradycardia, a pulse rate of 40 per minute or under, where there is heart-block, resulting from extensive interference with the bundle of His. The posterior coronary artery nourishes the bundle of His and thrombosis of this vessel or its branches must be fairly extensive to affect the bundle because the collateral circulation is more extensive posteriorly. Tracings at this stage, even if taken serially, apart from confirming the clinical diagnosis, are no guide to prognosis.

The use of anti-coagulants has materially improved prognosis and all cases of moderate or severe coronary infarction should be given the protection of heparin and dicumarol. Heparin, being the safer anti-coagulant (since it requires no daily prothrombin

estimation and can be more easily controlled) is the ideal medicament. It has a 48-hour delayed action during which dicumarol may be employed cautiously. The Committee set up by the American Heart Association investigated 800 cases of coronary thrombosis (American Heart J., 801-815, December 1948). Of this total 368 patients were treated on conventional lines while 432, were, in addition treated with the anti-coagulants heparin and dicumarol. Mortality in the control-group was 24% and in the treated group 15%. The lower mortality rate in the latter group was due to the lower incidence of thrombo-embolic complications, the latter in the control-group was 25%, while in the group treated with anti-coagulants it was only 11%.

The ultimate outcome of any case of myocardial infarction is in the lap of the Gods for however the careful and experienced physician may ponder on this or that circumstance, he cannot, in the scheme of things, evaluate with any certainty the morbid processes which are at work in the heart of his patient.

## MASSIVE RESECTION OF SMALL GUT—REPORT OF A CASE

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The patient reported on in this paper is probably unique in that he is alive 18 months after a small intestinal resection that left him with approximately seven inches of small bowel between his duodenum and caecum.

The patient, a European male of 28 years, was admitted to Groote Schuur Hospital 18 months ago with a 24-hour history of severe abdominal pain, vomiting and absolute constipation. At the age of 12 he had an attack of severe abdominal pain of a colicky nature that lasted about 12 hours but was not associated with vomiting. Following this he had about 12 similar attacks, but milder in nature, and then the final attack that brought him to Hospital. A diagnosis of acute intestinal obstruction was made and he was prepared for operation.

At operation he was found to have a volvulus of the small intestine with massive gangrene. When the volvulus was undone the following observations were made:

1. There was non-fixation of the mesentery of the small intestine so that the intestine was suspended from the posterior belly wall by a narrow pedicle which contained the superior mesenteric vessels.
2. The small intestine was completely gangrenous from about three inches distal to the duodeno-jejunal flexure, at the root of the transverse mesocolon, to a point on the terminal ileum about three inches proximal to the caecum.
3. The entire large intestine was completely normal and showed no sign of infarction.
4. No pulsation could be felt in the superior mesenteric artery.
5. A large artery was felt pulsating in the mesentery of the proximal jejunum.
6. A large artery was felt pulsating in the mesentery of the terminal ileum.

As there was no doubt that the small intestine was gangrenous, it was resected and an end-to-end anastomosis made between the proximal jejunum and the terminal ileum. When the operation was completed, it was estimated that the caecum was separated from the duodeno-jejunal flexure by a maximum of six or seven inches of small intestine. The accuracy of this estimate was later confirmed when an X-ray photograph was taken of the patient with a Miller-Abbott tube *in situ* (Fig. 1). The radiologist, Dr. E. van den Burgh, was certain that the metal tip of the tube had reached the ileo-caecal valve, and as the proximal holes in the tube are exactly half an inch apart and are clearly visible on the X-ray photograph, it is possible to calculate that the distance from the duodeno-jejunal flexure to the ileo-caecal valve is seven inches.

The patient was rather ill for two days and then improved rapidly, his bowels acting on the third day. He was given three pints of blood during the operation and for the next three days was given intravenous glucose-saline and protein hydrolysate. On the third day he was allowed to take fluids by mouth and his diet was gradually increased to a non-residue diet, mainly carbohydrate, low protein and fat free except for  $\frac{1}{2}$  oz. of cream daily. In addition he was given all the known vitamins and large amounts of calcium.\*

\*The Head Dietician, Miss N. M. Forbes and her Assistant, Miss M. E. Ensor were most helpful and co-operative in working out diets for him and their efforts are much appreciated. The nursing staff, too, are to be congratulated on their skill and patience with a patient who at all times was inclined to be a little difficult.

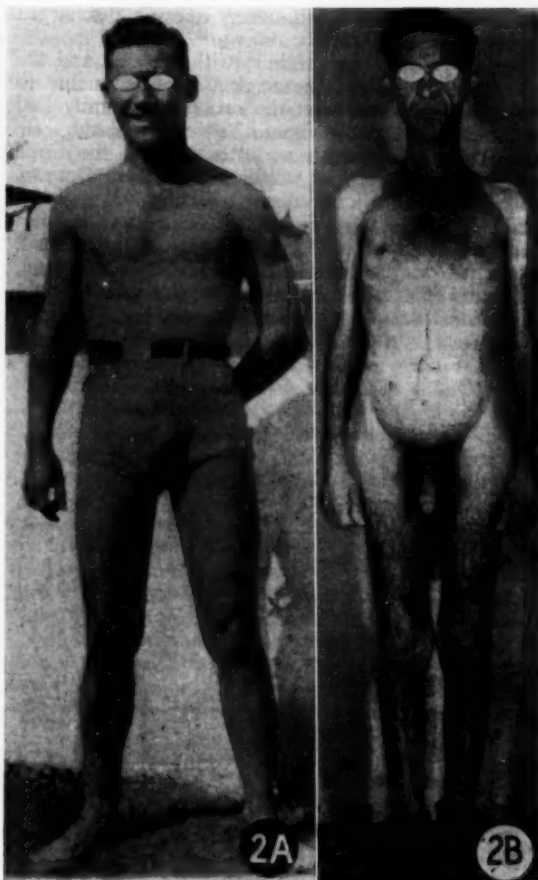
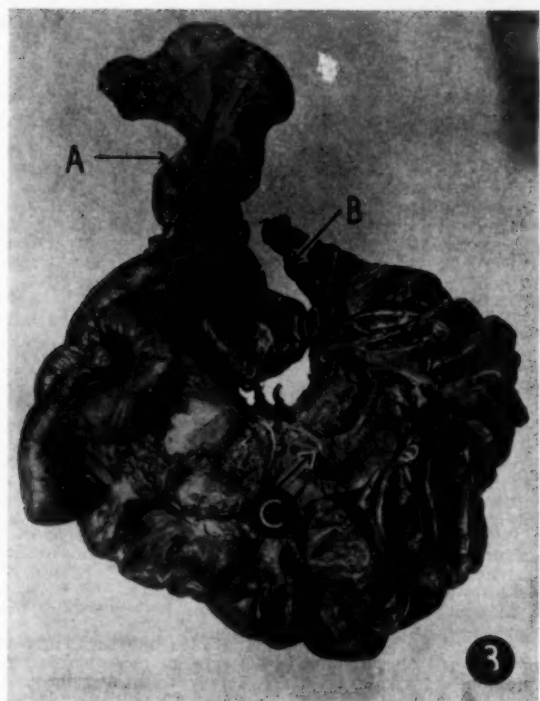


Fig. 1. An X-ray photograph of a Miller-Abbott tube *in situ* with the metal tip at the ileo-caecal valve. The proximal holes in the tube are half an inch apart (on the tube) and are clearly seen. The length of small intestine remaining between the duodeno-jejunal flexure and the caecum can be calculated as seven inches.

Fig. 2. (a) Photograph taken before operation, weight 135 lb.

(b) Photograph taken nine months after operation at the time of re-admission with pellagra. Note the pigmentation and cheilosis, also the marked wasting of the arms and thighs. The abdominal distension tends to mask the degree of wasting. Weight, 90 lb.

Fig. 3. Photograph of the dissected specimen.

(a) Probe in the anastomotic vessel in the mesentery of the proximal jejunum.

(b) Probe (foreshortened) in the anastomotic vessel in the mesentery of the terminal ileum.

(c) Point in branch of superior mesenteric artery where organized and calcified thrombus ends and fresh red thrombus begins.

His post-operative course was uneventful and he was allowed up on the tenth day after operation. He had from two to five liquid motions a day.

His weight before admission had been 135 lb. (Fig. 2a) and it steadily fell until it was 106 lb. three months after the operation, when he was discharged from Hospital.

He was instructed to continue with the diet and the vitamin tablets while at home, but he was unable to do so and had to eat what the rest of the family had and he did not take the vitamin tablets regularly. He actually returned to work as a foreman in the Cape Town Tramway Company Workshops, but after six months gave up the job because of increasing physical weakness and mental irritability. Nine months after the operation he was re-admitted to Hospital to Prof. F. Forman's wards with a diagnosis of malnutrition, pellagra and multiple vitamin deficiencies. His weight at this time was 90 lb. (Fig. 2b). He is still in

Hospital where Dr. Peter Jackson and Prof. G. C. Linder are carrying out extensive investigations on his digestive and absorptive functions. They will publish their findings at a later date.

**Anatomy:** Dissection of the specimen revealed the following facts which confirmed the observations made at the operation:

1. The superior mesenteric artery in its proximal part was completely obliterated by an old thrombus that was calcified in parts and extended for about an inch into the larger branches (Fig. 3).

2. The distal portions of the larger jejunal and ileal branches of the superior mesenteric artery and the arterial arcades contained fresh red thrombi.

3. Entering the mesenteries of the proximal jejunum and distal ileum close to the intestine, were two large arteries each the size of the radial. They both contained fresh red thrombi (Fig. 3). These two vessels could only have come from the anastomosis between the coeliac axis and the superior mesenteric artery, via the superior and inferior pancreaticoduodenal arteries, and the anastomosis between the superior and inferior mesenteric arteries via the marginal artery of the colon which links their respective middle and left colic branches (Fig. 4).

#### DISCUSSION

This case raises two interesting points for discussion; firstly, what happens to the intestine after arterial occlusion and, secondly, what is the minimal amount of small intestine required to maintain adequate nutrition.

The fate of the intestine after arterial occlusion is discussed in detail in an admirable paper by Klein<sup>6</sup> in which he comes to the following very interesting conclusions:

1. In experimental animals and in man, sudden occlusion of the superior mesenteric artery usually leads to infarction, but occasionally this is forestalled by the development of an adequate collateral circulation.

2. If the collateral circulation can only partially compensate, or if it later begins to prove inadequate due to progressive disease in the collateral arteries or to cardiac failure, the functional activity of the intestine will be impaired, i.e. the circulation will be adequate only for nutrition of the intestine but when the process of digestion with increased peristalsis increases the oxygen demand, the collateral circulation will be unable to meet this demand and a condition result that is analogous to intermittent claudication, viz. abdominal cramps, distension and constipation occur. This is more noticeable after large meals. Further impairment of the collateral circulation will lead to paralysis of the bowel but no infarction and still further impairment will result in infarction.

This analogy was first made by Schnitzler in 1901 (quoted by Klein<sup>6</sup> who referred to the following case:

'A woman aged 55, for five years had been suffering from marked constipation. During the last four of these five years the constipation had been accompanied by attacks of colic-like pain in the right hypochondrium and epigastrium. Until one half year before I saw her, the pain had often occurred after meals and had been relieved by vomiting. Since then, however, the vomiting had ceased and the pain which now occurred under the region of the umbilicus had become very much more severe. It now had no relation to meals and during the last few months had been almost constant.

Without a definite diagnosis an exploratory operation was performed. Gall stones were found and a cholecystectomy was done. The intestinal tract showed no abnormalities.

This operation had not the slightest effect on her pains. They continued without interruption until six weeks later when, after growing much weaker, she died.

At the autopsy there was found a haemorrhagic infarction of the small intestine and in the superior mesenteric artery a thrombus one centimeter long. This was firm and fibrous and of many months' duration in spite of the recent intestinal

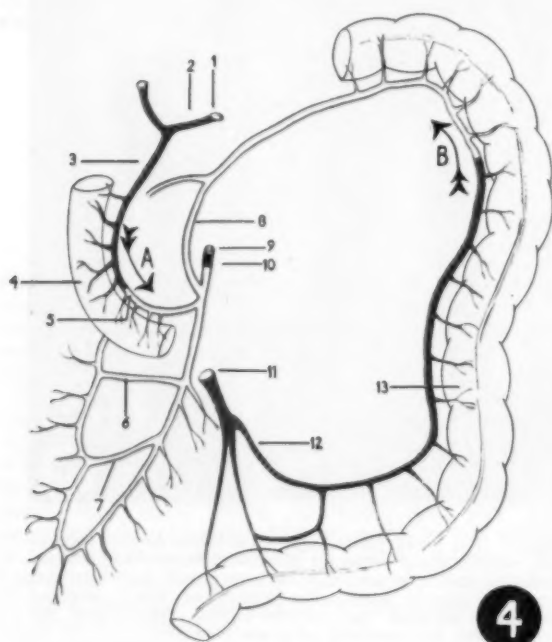


Fig. 4. Diagrammatic representation of the collateral circulation after occlusion of the superior mesenteric artery. The superior mesenteric artery distal to the point of occlusion is represented by dotted lines.

A: Anastomosis between superior and inferior pancreaticoduodenal arteries (coeliac axis and superior mesenteric artery).

B: Anastomosis between left colic and middle colic arteries (inferior and superior mesenteric arteries).

- |   |                                 |
|---|---------------------------------|
| 1. Coeliac axis.                        | 7. Ileocolic artery.            |
| 2. Hepatic artery.                      | 8. Middle colic artery.         |
| 3. Superior pancreaticoduodenal artery. | 9. Superior mesenteric artery.  |
| 4. Duodenum.                            | 10. Site of occlusion.          |
| 5. Inferior pancreaticoduodenal artery. | 11. Inferior mesenteric artery. |
| 6. Right colic artery.                  | 12. Left colic artery.          |
| 13. Descending colon.                   |                                 |



infarction. The microscopic picture showed arteriosclerosis of the superior mesenteric artery and its branches.'

Obviously in this case the thrombus had gradually obliterated the superior mesenteric artery and the collateral circulation had time to establish itself, but subsequently broke down before death owing to progression of the degenerative condition in its vessels. Schnitzler was particularly interested in the attacks of pain and constipation occurring in the four years before death. He argued that if due to arteriosclerosis in the vessels of the muscles of the extremities, the blood supply was so diminished that exercise rapidly resulted in ischaemia and pain, it was reasonable to expect the same to occur in the muscle of the intestine when its blood supply could not increase sufficiently to meet the increased demands made on it by the intestine during digestion with increased peristalsis.

The following case reported by Councilman (quoted by Klein) is an interesting example of a paralytic condition of the intestine that eventually caused the death of the patient without infarction occurring in the intestine. The intestine was all the time supplied with sufficient blood to maintain its viability but insufficient to permit peristalsis:

'A woman, aged 85, developed symptoms of intestinal obstruction that grew progressively worse and caused death. There was vomiting that became distinctly faecal and constipation that resisted all treatment.

At autopsy the abdominal aorta was covered with calcified plaques, many of them surmounted with thrombi. A thrombus over the mouth of the superior mesenteric artery extended for a short distance into it but did not completely occlude the lumen. There was no change whatsoever in the intestine.'

This idea of 'claudication' of the intestine is a very reasonable proposition. It is a diagnosis that is only very rarely made before death and not much more frequently after autopsy; nevertheless it is felt that there is sufficient evidence in the case here reported to warrant such a diagnosis.

It is suggested that the first attack of abdominal pain the patient had at the age of 12 years was due to intestinal ischaemia, the result of a volvulus that did not produce occlusion of the intestinal lumen as there was no vomiting, but occluded the superior mesenteric artery. Being a child with elastic vessels he was able to develop a collateral circulation rapidly enough to prevent infarction and then was able further to improve this to allow full functional activity of the intestine. The subsequent attacks of abdominal pain would be due to a recurrence of the volvulus producing a recurring, transient compression and partial occlusion of the collateral circulation with resultant ischaemic pain. The last attack of abdominal pain followed a volvulus which now persisted and, obstructing both collateral vessels, led to infarction of the intestine. That this suggestion is at least anatomically sound is shown by the presence of the old calcified thrombus in the superior mesenteric artery (Fig. 3) while the two collateral vessels are occluded by fresh thrombus.

The minimal length of small intestine required for adequate nutrition has not yet been determined. Haymond<sup>4</sup> in 1935 collected from a review of the literature 257 cases of massive resection of the intestine and concluded that 33% of the small

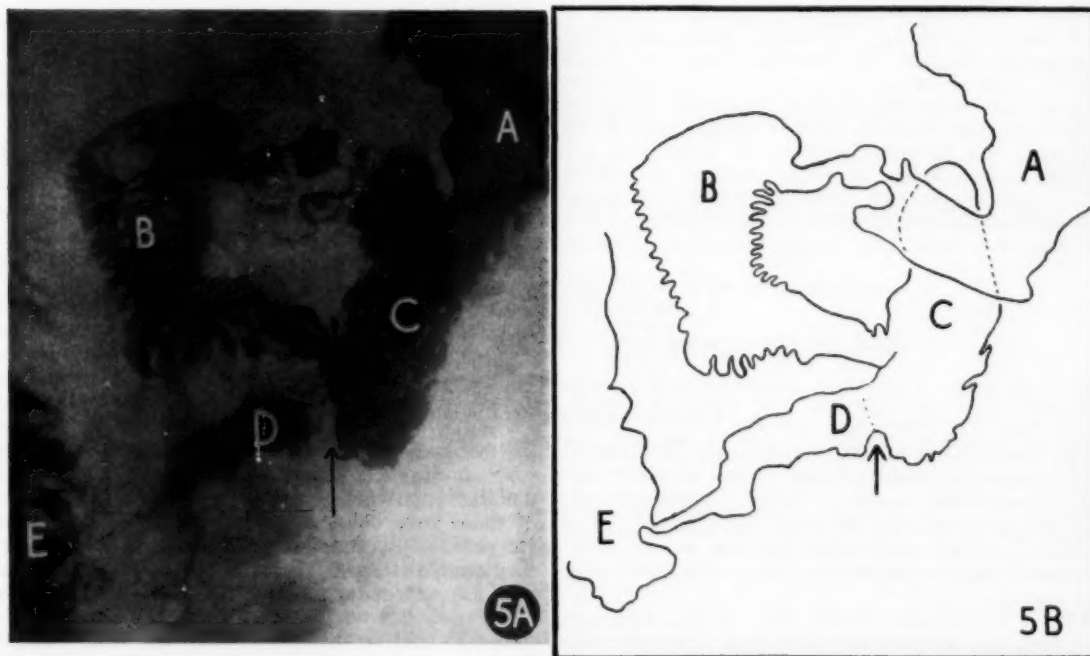


Fig. 5. (a) Barium meal taken eight weeks after operation. (b) Line drawing of Fig. 5a. Note the marked dilatation of the duodenum and proximal jejunum in contrast with the terminal ileum which is about normal in size. The arrow points to the approximate site of the anastomosis.

intestine could be resected and the digestive tract return to normal function; 50% removal constituted the 'upper limit of safety' and above 50% 'must necessarily obtain poor results even though an exceptional case may be better than predicted'.

Holman<sup>5</sup> in 1944 reported a case that actually gained weight after a resection of small and large bowel that left him a 'few feet' of jejunum anastomosed to the middle of the transverse colon.

Elman and Read<sup>3</sup> in 1945 resected all the intestine between the first three feet of the jejunum and middle of the transverse colon for multiple fistulae due to Crohn's disease. After the operation the patient gained the 50 lb. in weight he had lost since the onset of his illness.

Mayer<sup>7</sup> in 1946 reported a case who had been left with only 18 inches of jejunum anastomosed to the middle of the transverse colon and who developed 'no serious digestive disturbances or inanition'.

Berman *et al.*<sup>1</sup> in 1947 reported a similar case with no digestive disturbances eight months after resection of the small and large bowel that left the patient with 18 inches of jejunum anastomosed to the middle of the transverse colon. He concluded that about two thirds of the small intestine may be safely excised.

More recently Cogswell<sup>2</sup> in 1948 resected all the small intestine beyond the first 14 inches of the jejunum and anastomosed the jejunum to the side of the ascending colon. Six months after this the patient was still well.

Fourteen inches of small intestine is the shortest length so far recorded able to maintain adequate nutrition. The case now reported has seven inches of small intestine but has developed gross nutritional disturbances so that the shortest length of small intestine required for adequate nutrition may in certain fortunate individuals be between seven and 14 inches. Furthermore, the resulting marked hypertrophy of the duodenum and proximal jejunum in contrast to the terminal ileum which is about normal in calibre (Fig. 5) does suggest that more absorption is occurring from the duodenum and jejunum than from the ileum and that this may also occur normally. This is

opposed to the generally accepted belief that very little absorption occurs from the duodenum.

#### SUMMARY AND CONCLUSIONS

1. The case is reported of a man, alive but with gross malnutrition and vitamin deficiencies 18 months after resection of all but seven inches of his small intestine.

2. Three cases have been collected from the literature where no nutritional disturbances resulted after resection of all but 18 inches of small intestine in two of these cases and 14 inches in the third. It is therefore suggested that the minimal length of small gut (excluding duodenum) required for adequate nutrition may occasionally be between seven inches and 14 inches.

3. In the case here reported thrombosis of the superior mesenteric artery 12 years before operation was followed by the development of an adequate collateral circulation. It is suggested that this collateral circulation was subsequently partially and intermittently occluded to give rise to ischaemic pain originating in the small gut and analogous to intermittent claudication of the extremities and that when the occlusion of the collateral circulation finally became complete, infarction of the small intestine occurred.

4. It is suggested that more absorption occurs from the duodenum and proximal jejunum than from the terminal ileum.

I wish to thank Prof. J. F. P. Erasmus for permission to publish this case and for a grant from the Department of Surgery for the reproduction of the colour diagram.

I am indebted to Mr. G. McManus for the excellent photographs.

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## SOLITARY DIVERTICULITIS OF THE CAECUM

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Solitary diverticulitis of the caecum is a little-known entity, barely mentioned in most of the standard surgical textbooks; but, as Grace<sup>1</sup> states, 'it cannot be as infrequent as its reported incidence might imply'. The recognition of the condition at operation and its treatment are of primary importance; hence this report may be of interest.

M.T., a 41-year-old Hindu lorry driver, living in Vrededorp, was admitted to the ward on 7 January 1950 with the provisional diagnosis of 'acute appendicitis with abscess'.

His major complaint was pain in the right iliac fossa

for three days. He had been well until three days ago when, in the evening, he developed a pain just above his umbilicus and another pain in the left iliac fossa. Both of these were colicky, the former being more severe. He slept badly, and the next morning his pain was in the right iliac fossa. It remained there, becoming worse, until his admission to hospital.

On the day of admission he had dark, watery motions. Before that his bowels had acted normally. There was no nausea or vomiting, although he had complete anorexia for the two days before admission. No headache, no cough, and no urinary disturbance.

In 1944 he had been hospitalized for a perforated peptic ulcer. After the operation he remained symptomless. There were no other illnesses of note in the past history.

Examination revealed a spare adult Indian, obviously very ill. Pulse, 100 per minute. Blood pressure 140/100 mm. Hg. Temperature 101° F. Nothing significant was found in the head, neck, chest or extremities.

The abdomen was scaphoid, moving slightly on respiration. Severe tenderness was present in the right iliac fossa. Local rigidity and rebound tenderness were marked. Pressure in the left iliac fossa produced pain in the right side. Bowel sounds were heard.

Rectal examination was non-contributory.

The leucocyte count was 12,000 per c. mm., and the urine was normal.

A confident diagnosis of acute appendicitis was made, and under general anaesthesia the abdomen was opened by a Rutherford Morison muscle cutting incision. The appendix was found to be normal, but a mass was palpated in the caecum. A purplish swelling about an inch in diameter was then seen on the anterior wall of the caecum. The apex of this had ruptured, and a bead of pus was exuding. Nevertheless the base of the swelling felt hard and the regional lymph nodes in the mesentery were enlarged. Fearing that the condition might be a carcinoma, tuberculoma, or amoeboma, the surgeon resected the last foot of ileum, caecum, and ascending colon with a wedge of mesentery. The transverse colon was then mobilized, found to be normal, and an ileo-transverse anastomosis performed.

Post-operative therapy consisted of penicillin, gastric suction and intravenous feeding. Except for a few minor snags he made a satisfactory recovery.

Examination of the resected specimen revealed a soft, fluctuant bluish mass, about an inch in diameter, presenting at the centre of the anterior surface of the caecum. The base of this mass was hard. Inspection of the lumen of the bowel opposite the mass revealed a shallow ulcer about half an inch in diameter. On incising through this ulcer, it was seen to lead into a diverticulum which contained a hard faecolith some  $\frac{3}{4}$  inch in diameter, and distal to this a small amount of yellow pus was present. The specimen was sent for pathological report, which was as follows: 'Sections of this specimen from the caecum show the presence of a diverticulum in which there is marked acute inflammatory change. The wall of the diverticulum is formed by inflamed fat, serosa, and connective tissue. There is ulceration and destruction of the mucosal and muscle layers. No evidence of malignancy, tuberculosis or amoebiasis has been observed'.

#### COMMENT

Fairbank and Rob<sup>2</sup> report two cases and state that they cannot find a single clinical point of difference between this condition and acute appendicitis.

The most comprehensive review of the condition is that of Bennett-Jones<sup>3</sup> of Liverpool who, in 1937 analysed every one of the then 17 reported cases of solitary diverticulitis of the caecum, and added three of his own.

Dorling<sup>4</sup> is of the view that since the caecal diverticulum is solitary, it has a different etiology from multiple diverticulosis of the colon and is against the cause being a pulsion from within. Only one case can be traced, that of Lawrence Abel,<sup>5</sup> which also had an associated diverticulosis of the colon.

Baker and Carlile<sup>6</sup> review 37 cases collected in British and American literature up to 1943 and add two of their own. They find, amongst other facts, that the ages varied from 10 to 69 years; 21 were females; in 18 previous attacks of pain in the lower abdomen had occurred, and vomiting was only present in five.

As to the location of the diverticulae, 25 of the 39 are indicated fairly clearly. Three were present on the posterior surface of the caecum, six at the centre of the anterior wall, and the remaining 14 on the lateral, medial or inferior surfaces.

*Treatment.* Most surgeons, fearing the presence of malignancy, perform a hemi-colectomy.

Busch and Friedfeld<sup>7</sup> advise resection of the diverticulum with the adjacent caecum, as does Dorling.<sup>4</sup>

Dean Lewis<sup>8</sup> states that in a few cases it is possible to dislodge the faecolith and invert and bury the diverticulum.

My thanks are due to the superintendent, Dr. V. D. Gordon, to my chief, Mr. Hamman, and to Dr. D. Stirton, surgical registrar, for permission to publish this case.

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#### NEW PREPARATIONS AND APPLIANCES

##### DEXMAL

Dexmal has the following composition:—

Maltose ... ..	64%
Dextrin ... ..	14%
Ash (mainly sodium chloride) ...	2%
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Dexmal is a purely soluble carbohydrate, and is made by the enzymic hydrolysis of starch, a process which converts the starches into dextri-maltose. The product is a partly pre-digested food, and therefore is specially useful in the feeding of very young or delicate babies.

Because Dexmal contains a relatively high percentage of maltose it is more laxative than a product having proportionately large quantities of dextrin. As it is a mixture of di-saccharide and poly-saccharide, it can be assimilated very easily and is less fermentable than cane sugar. The colloid action which promotes a soft motion clears out the small intestine before any harm can be done.

It is offered in syrup form and has an advantage in that it is not hygroscopic.

Dexmal is packed in 10 fluid ounce bottles but owing to the high specific gravity, the nett weight of the contents is approximately 17 ounces. It will be sold through the medium of the chemists only, at a retail price to the public of 3s. per bottle.



## MEDICAL ASPECTS OF ROAD SAFETY\*

A. W. S. SICHEL, M.D., D.O. (OXFORD), D.O.M.S. (LOND.)†

When considering the factors concerned in the promotion of road safety, the problem in broad terms can be described as three-fold, the road, the vehicle and the human element, popularly referred to as 'the man at the wheel'. Most of the discussions at meetings and the greater part of the literature dealing with road safety centre on the first two factors, which, in turn, are the province of the engineers and the officials whose duty it is to enforce the law. However excellent the construction of roads and however roadworthy the vehicles that travel on them, the ultimate and determining factor in the majority of accidents that occur is the human control. This, unfortunately, is apt to be accorded a position of secondary importance. The great improvements that road engineers have effected and may still effect in the construction of our roadways, and the technical excellence attained in the design and performance of the modern high speed motor vehicle, offer an inducement to drivers to take risks which are quite unwarranted. This paper is an attempt to lay emphasis on those factors associated with the roadworthiness of the individual as opposed to that of the machine.

The human driver possesses a mind and a body, a distinction constantly to be kept in view in considering what, broadly speaking, are the medical aspects of road safety. Statistics the world over show that by far the greater number of accidents on our roads are due to psychological factors, such as faulty judgment, rashness, impetuosity and bravado, and only a small percentage to defects of a physical character. The problem from the psychological aspect is one for psychiatrists, educationalists, publicity agents and research workers, leaving the purely medical aspect to the medical practitioner.

As things are in South Africa to-day, it is possible for any man or woman over the age of seventeen to take out a driving licence on payment of a relatively small fee and to be permitted to drive a motor vehicle, after a driving test, without any regard to the state of his or her health, unless there be some very obvious physical defect that cannot escape the perception of even a layman. If we are to be in earnest in our endeavour to reduce materially the sad toll of the roads, it is our bounden duty to eliminate the physically defective and those showing signs of gross mental abnormality as individuals unfitted to drive motor vehicles. As long ago as 1937 the Medical Association of South Africa at a meeting of its Federal Council in Bloemfontein adopted the following resolution:—

'That this Federal Council, in view of the large number of

motor accidents, wishes to bring to the notice of the Provincial Authorities the importance of an adequate medical examination in regard to the issuing of motor driving licences.'

A strong case is made out for compulsory medical examination to which all applicants for driving licences should submit, particularly in the case of those who have to handle public service vehicles such as motor and trolley buses carrying passengers. Drivers of such vehicles should undergo a stringent medical examination requiring a high degree of physical fitness of no less degree than that laid down by railway authorities for engine drivers. There should also be an annual re-examination.

No one possibly could oppose such a requirement when hundreds of lives in public transport vehicles are, temporarily at least, dependent on the human element in charge of the controls. In the case of drivers of private vehicles a plea for some relaxation in medical requirements may be argued. When it is remembered that thousands of individuals depend on the possession of a driving licence in order to earn a livelihood, and that only a small percentage of accidents are caused by physical defects, the need for compulsory examination may not appear to be so great. It has been suggested that a hardship would be inflicted on the potential driver by reason of having to pay for the necessary medical certificate. This, however, would be a trivial additional expense after the owner-driver has paid a substantial sum for his car and all the items that go with it, such as insurance, licence, number plates and third-party risk.

It would facilitate the procedure if, in the larger centres at least, applicants for driving licences could be examined at fixed times at the traffic depot by medical practitioners appointed for the purposes. In the case of owner-drivers the medical examination would be a simple one, designed to exclude gross physical defects and advanced or chronic pathological conditions, but would include tests for vision and hearing. The medical examiner would issue a certificate that, after a general examination, the applicant in his opinion was a suitable person to be in charge of a motor vehicle. If, on the other hand, in his opinion the applicant was unfit, he would state the nature of the defect and thus allow an opportunity for a more intensive investigation of the condition rendering the applicant unfit. In every case the right of appeal against the finding of the medical examiner should be afforded by statute. Not only would compulsory medical examination eliminate the obviously unfit, but would inculcate in the applicant's mind the importance of being physically fit and the responsibility he is about to undertake.

In addition to a medical examination, the applicant for a driving licence should be required to complete a questionnaire or personal statement giving, *inter alia*, information on the following points:—

(a) His habits as regards the taking of drink, or narcotic and habit-forming drugs.

\* Presented at the first general meeting of the Cape Province Road Safety Committee held in Cape Town on 25 and 26 April 1950.

† Member of the Executive Committee of the Council of the N.R.S.O. of S.A. and President of the Medical Association of South Africa.

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(b) Whether he is subject to fits or other nervous disease, and whether he has ever been treated for any form of nervous or mental disorder.

(c) Whether he suffers from asthma, chronic cough or tuberculosis; palpitation, faintness, shortness of breath or pain in the chest.

(d) Whether he suffers from defective vision, night blindness or colour blindness.

He should be asked in addition whether he has required medical advice within the previous five years and if so, for what reason. A penalty should be prescribed by statute for giving false information when completing the statement.

Certain important conditions will be considered in some detail.

#### VISION

Excluding drivers of public service vehicles where a reasonably high standard of vision should be obligatory, defective vision plays less part in the causation of road accidents than is popularly imagined. When thinking in terms of vision a clear distinction must be made between acuity of vision, field of vision, colour vision and adaptation of vision.

*Acuity of vision* is the ability to appreciate the form and contour of objects. It is generally measured by means of Snellen's test types or by numerals of a specified size read at a stated distance. In existing ordinances it is prescribed that the registering authority shall not issue a driving licence if the applicant is unable to read at a distance of 75 feet in good daylight, with glasses if worn, a series of six letters and figures in white on a black background of the minimum size and arrangement as those prescribed for distinctive marks and numbers on motor vehicles; that is to say the markings on the number plate of a car. Statistics, however, indicate and experience shows that very few accidents can be attributed to defective visual acuity *per se*. In the writer's experience many individuals, though possessing poor visual acuity, are nevertheless capable drivers. Being aware of their visual shortcoming they exercise greater caution on the road.

*Colour Vision.* This is of very great practical importance in the examination of navigators, engine drivers and air pilots, but is proved by statistics to play a very small part in the causation of road accidents. Colour-blind individuals when approaching a robot will stop and move forwards with the general stream of traffic, or else interpret the colours by their position as displayed in the robot, red, amber and green from above downwards. Even failure to detect the red of a rear light is no great disability. The driver soon senses that the light is moving with him, advancing to meet him, or is stationary. The fact that it is a light, not necessarily a red light, is sufficient warning as to what action he should take.

*Field of Vision.* This is termed side vision in the United States of America. Restriction of the fields of vision is a much more potent cause of accidents. It will be appreciated readily that inability to detect a vehicle converging from a side road towards a point of intersection until too late may precipitate a collision. Such restriction of side vision again might prevent a driver from seeing too late a pedestrian stepping off a side walk, with possibly disastrous results to the jay-walker.

There is always an outside chance that the pedestrian himself may suffer from defective side vision.

*Adaptation of Vision.* Most dangerous of all visual defects is so-called night blindness or deficiency of light adaptation. There are individuals whose visual acuity in daylight is perfect, but who in darkness are partially or even completely blind. This defect cannot be discovered by simple medical examination. It might pass undetected unless sought for by special investigation or unless the applicant, who usually is aware of his disability, were required to answer a specific question as to his night vision at the time of medical examination. As instances of conditions giving rise to night blindness may be cited retinitis pigmentosa, a not uncommon and hereditary disease of the eyes, and vitamin deficiencies, notably that of vitamin A.

It must be emphasized that in the case of drivers of public service vehicles a relatively high standard of visual acuity should be demanded, and that there be no defective side vision, abnormality of colour vision and no night blindness.

When persons are brought before the courts charged with negligent or dangerous driving, magistrates should be given discretionary power to order a thorough medical examination, including investigation by an ophthalmologist.

#### HEARING

Statistics show that, generally speaking, defective hearing plays little if any part as a cause of road accidents. An individual who is deaf usually keeps a sharper look-out on that account. He does not depend on the warning of a hooter to increase his awareness of danger. Indirectly, however, deafness may render a driver unable to detect a mechanical noise which should warn him that all is not well with the running of his vehicle and prompt him to stop in order to investigate the cause. In the case of public service vehicles an adequate degree of hearing should be obligatory in the granting of a driving permit. Even partial defective hearing affecting one ear only might prevent the driver from hearing the conductor's signal to stop or proceed; or again it might make him less likely to hear a scream or shout from a passenger slipping when boarding or alighting from his vehicle, in which case it would be incumbent on him to stop immediately.

#### AGE

The question of age in relation to safe driving will always be debatable. That there should be a minimum age below which an individual is not allowed to drive is desirable, if not imperative. The age of 17 generally is accepted as a reasonable one. At what level a maximum age, if any, is fixed opens up a wide field for discussion. While no one would agree that a tottering old wreck should be allowed on the road in charge of a car, it must be borne in mind that individuals vary greatly in the manner in which their physical condition deteriorates with increasing age. The average elderly driver is aware that his faculties are on the decline and on that account is more careful and disinclined to take risks. Generally speaking, he can be regarded as a safer driver than the younger, physically fitter and more

venturesome one. The aged driver, nevertheless, can be an indirect cause of danger as, for instance, in being ultra-careful and too slow on a winding road, thereby holding up faster-moving traffic and tempting the impatient driver behind him to overtake on a blind bend.

The desirability of re-examination in regard to driving ability and physical condition at fixed age period is of importance. Its practical application, however, presents difficulties. A reasonable proposition would be re-examination at 10-yearly intervals and compulsory cancellation of driving licences at the age of 80 years.

The physical disabilities associated with increasing age, generally speaking, include slowness in reaction time, decreasing ability to co-ordinate, muscular weakness, tremor and diminished visual acuity, not to mention more rapid onset of fatigue, both physical and mental.

In regard to drivers of public service vehicles it is obvious that there should be not only an annual re-examination but a compulsory retiring age, that of 60 being a reasonable one.

#### FATIGUE

Fatigue, both physical and mental, is an important factor in the causation of accidents, but something which cannot be assessed at the time of medical examination. Numerous instances can be adduced of even the fittest of drivers dozing at the wheel after long hours of work, or even as the result of mental worry. The onset of fatigue is a gradual process often not appreciated by a driver until he suddenly discovers he has wandered off the road or has narrowly escaped hitting an obstruction. Motorists are well aware of the hypnotic effect of driving over long stretches of straight, well-surfaced roads where the very monotony readily induces fatigue. So too the practice of indicating a road margin by white stones regularly interspaced can act as a lullaby to the tired driver.

The avoidance of accidents in the causation of which fatigue is a contributory factor, to a large extent is the responsibility of the road engineer, but much can be achieved by propaganda to impress on motorists not to travel on and on when they are aware of the fact that they are dog-tired. This applies particularly to night driving.

#### ALCOHOL

Drunkenness is one of the commonest causes of accidents, a statement unfortunately only too true. Scarcely a day passes without reference in the press to cases appearing in the courts of negligent or dangerous driving where the accused is alleged to have been under the influence of alcohol. When a driver is apprehended and taken to the charge office, the question whether he is drunk is decided in the first place by a police officer, who bases his opinion on the physical and mental state of the person under arrest. The characteristic signs of drunkenness are as well known to the layman as they are to a medical practitioner and need not be detailed here. Great importance is attached to the smell of the breath. This,

however, indicates merely that alcohol has been consumed, but is no index of the amount imbibed.

Drugs other than alcohol, certain diseased conditions, and physical injury may bring about a profound disturbance of behaviour simulating the intoxication due to alcohol. It is common knowledge that in cases of alleged drunkenness the defence will rely on any evidence available to disprove the allegation, with the result that proof of drunkenness becomes a matter of opinion. It is generally agreed that the problem would be simplified very considerably if the blood of the accused person could be examined chemically to determine its alcohol contents. If the result of the chemical test is negative, or nearly so, it will substantiate the claims of the innocent; if it is positive, it will assist the court in meting out justice to the guilty.\*

Except in extreme cases such a test cannot be accepted as a reliable, single test for drunkenness. At most it must be regarded only as a contributory factor in relation to the rest of the evidence, including the medical examination.

In many countries, provision is made by statute for carrying out chemical tests on accused persons as proof of drunkenness; in at least one European country it is accepted as the sole index.

As far as the Union of South Africa is concerned it is doubtful whether a medical practitioner lawfully can extract blood from the vein of an accused person for the purpose of determining its alcoholic content without the consent of the accused. A further complication lies in the fact that, even if a person under the influence of drink gives his consent, in law such consent is invalid. If it is deemed advisable to make such a test compulsory, it would appear that the law as it stands to-day must be clarified and, if necessary, amended.\*

If eventually the right of a medical practitioner to take blood from an accused person is embodied in the law and made a routine procedure, the conditions under which it is done will have to be defined most precisely. The procedure, which incidentally is practised extensively by the medical profession for clinical purposes, can be carried out without risk if the usual sterilising precautions are taken in the preparation of the syringe and needle. Sterilization with alcohol must be ruled out and the apparatus boiled in the usual manner. Preferably only district surgeons would be called upon to take the blood and their evidence would have to indicate that the proper technique has been employed. The actual chemical test would be undertaken only by recognized laboratories, such as the Government Chemical Laboratories, University Departments and Research Institutes.

It should be mentioned that the Medical Association of South Africa attaches such importance to the matter that, at the meeting of its Federal Council held at Cape Town in September 1949, the following resolution was adopted and submitted to the proper quarter:—

'That this Federal Council draws the attention of the Minister of Justice to the great value of modern established chemical

\* The Criminal Procedure and Evidence Amendment Bill, at present before Parliament, makes provision for a district surgeon to take a specimen of the blood of any person arrested upon any charge.

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tests in finding objective evidence of the taking of alcohol and their assistance in the assessment of drunkenness. Further, that it requests him to introduce legislation to enable these tests to be performed on persons suspected of being under the influence of alcohol.'

#### DAZZLE

Every motorist, cyclist or pedestrian knows the effect of being subjected to the glare of approaching headlights. This, if not in itself a danger, is at least a source of considerable inconvenience and annoyance to other users of the road. The owner of the offending headlights may contend that he needs adequate illumination if he is to avoid the dangers that lie in his path. This argument, however, will not hold good unless he admits at the same time that he is driving at a speed so great as to prevent him from coming to a stop in time to avoid the danger.

In reports of cases of negligent or dangerous driving coming before the courts it is a frequent experience to read that one or other of the parties concerned contended that he was blinded by oncoming headlights. In the discussion of the problem of how to prevent dazzle, attention appears to be focussed entirely on the mechanical aspect, to the absolute disregard of the human element.

Earlier in this paper, when dealing with vision, reference has been made to light adaptation. The human eye has two distinct and separate mechanisms, one concerned in daylight, the other in night vision. The time taken by the healthy eye to adapt itself from light to dark conditions, and *vice versa*, varied considerably in different individuals. This reaction time may be as brief as two minutes or as long as 20 minutes or more. In the case of a motorist driving at night with his eyes dark adapted, the glare of approaching lights may upset the process of retinal adaptation to such an extent as to render him 'blind' for the time being. Averting the gaze from the approaching beam may help some individuals, but in the case of others, once having received the full dose of glare, relative blindness may persist for an appreciable time.

However perfect the results of mechanical achievements of the future in reducing dazzle by one method or another, it must be borne in mind that what is considered of reasonable brightness to one type of eye may be relatively overpowering to another.

For the reasons outlined above, it is the considered opinion of the writer that the problem of dazzle will never be solved to the extent that dazzle will cease to be a danger or at least an inconvenience in the future. Efforts must be directed not only to perfecting the mechanism fitted to the vehicle, but also by propaganda to educating the individual. However effective the dipping device fitted to the most perfect of headlamps, the glare emitted constitutes a danger if the driver does not dip. However reasonable the beam of a dipped headlamp may be in the opinion of the majority of experts, there will still be eyes that cannot tolerate it. Those who are readily 'blinded' by approaching headlamps must be educated to stop or at least slow down. The fitting and maintenance of proper headlights is a matter for enforcement.

In conclusion it is desired that this paper will

stimulate interest as regards the medical aspect of road safety in those who previously have not given the matter much thought. It has been written in an attempt to state the facts as concisely as possible and to avoid unnecessary detail but yet in a manner intended to provoke criticism. The statements made, other than factual, are largely the personal views of the writer.

#### THE PREPARATION OF SYNOPSES\*

In 1949 the Royal Society distributed a *Guide for the Preparation of Synopses* which had been prepared by its Abstracting Services Consultative Committee. This Guide is reproduced below, prefaced by explanatory paragraphs taken from the Royal Society's covering letter: 'One of the recommendations of the Royal Society Scientific Information Conference (July 1948) was: "The present general unsuitability of authors' summaries for use as abstracts is recognized; nevertheless, if these could be used it would increase the speed of publication and reduce the cost of journals publishing abstracts. It is therefore recommended that the Royal Society invite editors of scientific journals to co-operate with abstracting organizations by seeing that each paper is accompanied by a factual summary suitable for use as an abstract in appropriate journals of abstracts; and that, at the same time, abstracting organizations be called on to formulate agreed principles to guide editors of scientific journals."

Consideration has been given to this by the Abstracting Services Consultative Committee and the Royal Society Information Services Committee. The latter has submitted the following recommendations to the Council of the Royal Society and these were endorsed at a meeting on 7 April 1949:

1. It is desirable that every paper appearing in a scientific journal be accompanied by a synopsis which should be independent of the text and figures and should preferably appear at the beginning of the paper.

2. The synopsis should be subject to the same editorial scrutiny and correction as is usual for the full paper. Automatic acceptance of a synopsis written by an author is not desirable.

In endorsing these recommendations, Council asked that when authors' synopses are used by abstracting services, this should be clearly indicated in the abstract.

It is appreciated that in many journals papers are already accompanied by summaries and many of these have long been recognized as of very high value. It has become apparent, however, that the use which is made of these summaries is not always clear to authors and perhaps even to editors, and it is therefore hoped that a useful purpose will be served by making available the enclosed *Guide for the Preparation of Synopses* which has been prepared by the Abstracting Services Consultative Committee.

We are desirous to forward it to you with the suggestion that you may care to adopt these recommendations, if you are not already doing so, and to bring the Guide to the attention of your authors.'

#### GUIDE FOR THE PREPARATION OF SYNOPSES

1. *Purpose.* It is desirable that each paper be accompanied by a synopsis preferably appearing at the beginning. This synopsis is not part of the paper; it is intended to convey briefly the content of the paper, to draw attention to all new information and to the main conclusions. It should be factual.

2. *Style of Writing.* The synopsis should be written concisely and in normal rather than abbreviated English. It is preferable to use the third person. Where possible use standard rather than proprietary terms, and avoid unnecessary contracting.

It should be presumed that the reader has some knowledge of the subject but has not read the paper. The synopsis should

\* Published for general information at the request of the C.S.I.R. Library and Information Division.

therefore be intelligible in itself without reference to the paper; for example, it should not cite sections or illustrations by their numerical references in the text.

3. *Content.* The title of the paper is usually read as part of the synopsis. The opening sentence should be framed accordingly and repetition of the title avoided. If the title is insufficiently comprehensive the opening should indicate the subjects covered. Usually the beginning of a synopsis should state the object of the investigation.

It is sometimes valuable to indicate the treatment of the subject by such words as: brief, exhaustive, theoretical, etc.

The synopsis should indicate newly observed facts, conclusions of an experiment or argument and, if possible, the essential parts of any new theory, treatment, apparatus, technique, etc.

It should contain the names of any new compound, mineral species, etc., and any new numerical data, such as physical constants; if this is not possible it should draw attention to them. It is important to refer to new items and observations, even though some are incidental to the main purpose of the paper; such information may otherwise be hidden though it is often very useful.

When giving experimental results the synopsis should indicate the methods used; for new methods the basic principle, range of operation and degree of accuracy should be given.

4. *Detail of Layout.* It is impossible to recommend a standard length for a synopsis. It should, however, be concise and should not normally exceed 200 words.

If it is necessary to refer to earlier work in the summary, the reference should always be given in the same manner as in the text. Otherwise references should be left out.

When a synopsis is completed, the author is urged to revise it carefully, removing redundant words, clarifying obscurities and rectifying errors in copying from the paper. Particular attention should be paid by him to scientific and proper names, numerical data and chemical and mathematical formulae.

## IN MEMORIAM

ALEXANDER DANIEL EDINGTON, B.Sc., F.R.C.P.E.

### AN APPRECIATION

On 29 May 1950 Dr. A. D. Edington passed away at the age of 64 after a long illness courageously born.

Dr. Edington was the son of the late Dr. A. Edington, who was once in charge of the Bacteriological Laboratory in Grahamstown, the first of its kind in South Africa, and who was also the first Government M.O.H. for the Cape Colony, and the first Editor of the *S.A. Medical Journal*.

Alexander Edington was born in Edinburgh, and was educated at George Watson College and Edinburgh University.

After qualification he held various house appointments, and for a while he practised near London. His first introduction to Africa was as a member of the Belgian Congo Sleeping Sickness Commission.

As a first-class shot Edington kept the commission in meat during the many miles that it trekked through the bush.

He subsequently practised for a year or two in Rhodesia, but in 1913 made his home in Howick where he soon built up a very extensive practice, and in addition acted as District Surgeon. During the 1914-1918 war he served with the S.A.M.C., being mentioned in despatches and being awarded the *croix de guerre*.

He met and most happily married Helen Wilson in 1916. There were two children of the marriage, both of whom are medical practitioners. He proceeded to the M.D. of the University of Edinburgh in 1922 and returned to his wide practice at Howick, until 1925 when he joined Dr. M. Pearson in partnership in Durban. He took the M.R.C.P.E. in 1927, becoming F.R.C.P.E. soon after.

In Durban he speedily made his mark, becoming one of the leading practitioners of the town, and being appointed as a physician to Addington Hospital. This work he ably continued until his health began to fail in the last four years of his life.

Dr. Edington was at his best in his wards, full of enthusiasm and interest, never stinting anything he had to give, and himself working harder than any of his staff. As one of his sisters said: 'He did a great deal for Addington.' It

was a joy to him that both his son and daughter were at one time his house physicians.

Some years after the Great War when the 2nd Field Ambulance was moribund, Edington took over command and worked it up to an efficient unit.

During the late war he helped several practitioners to join the Armed Forces by taking over work for them, and for several years he worked to the extreme limit of his endurance, spending many of his nights doing voluntary work at the Blood Transfusion Service after very busy days. He served on the Federal Council for some years and became President of the Natal Coastal Branch of the M.A.S.A.

In 1946 he began to be unwell and suffered from a coronary thrombosis. He retired from his practice, and was admitted to the roll of Specialist Physicians.

His health continued to give way, and he was gradually forced into retirement.

It was then that his outstanding quality of courage became clear to those with whom he associated. Despite the frustration of enforced rest to an enquiring mind and a restless temperament, he never gave up and he never complained. He continued to show interest in the doings of others, whether it was in the account of a trout fishing holiday of which once he had been so fond, or in the description of a difficult case in the wards where once he had been so happy.

A devoted husband and father, a keen and efficient physician who never spared himself, an excellent shot, a good trout fisherman, and an absorbed and knowledgeable philatelist, so will the memory of Alexander Edington remain long in the minds of his friends, his colleagues, and his patients.

3 June 1950.

J. A. M.

## PASSING EVENTS

Mr. C. A. R. Schulenburg, M.Ch. (Cape Town), F.R.C.S. (Eng.), of 50, van Riebeeck Medical Buildings, 295, Schoeman Street, Pretoria, recently gained the degree of M.D. with honours from the University of Pretoria for a thesis on *The Pathology of Jaw Tumours*.

Dr. Louis F. Freed of Johannesburg has been invited by the Department of Social Welfare of the Union Government to let his name go forward as a consultant-expert in connexion with the Advisory Social Welfare Services scheme of the United Nations.

### AWARD FOR OUTSTANDING RESEARCH IN THE FIELD OF INFERTILITY

The American Society for the Study of Sterility offers an annual award of \$1,000 known as the Ortho Award, for an outstanding contribution to the subject of infertility and sterility. Competition is open to those in clinical practice as well as individuals whose work is restricted to research in the basic sciences. Essays submitted for the 1951 contest must be received not later than 1 March 1951. The Prize Essay will appear on the programme of the 1951 meeting of the Society. For full particulars, address The American Society for the Study of Sterility, 20 Magnolia Terrace, Springfield, Mass.

Prof. S. F. Oosthuizen has accepted the new part-time appointment of Director of Medical Research of the Council for Scientific and Industrial Research.

Dr. A. H. Tonkin, Medical Secretary, has returned from a visit, as official representative of the Association, to the British Commonwealth Medical Advisory Council Meeting in Brisbane, Australia. Dr. Tonkin was also able to attend the Australian Medical Association Annual Congress.

Mr. Wm. G. Schulze, Ch.M. (Cape Town), F.R.C.S. (Eng.), has returned after three years' post-graduate study in England and the United States of America.

He worked at Guy's Hospital, London and Charing Cross Hospital, London, where he was surgical registrar and then for the last year he was senior surgeon at St. Mary's Hospital, Highgate Hill, London.

Mr. Schulze has begun practice as a specialist surgeon at 827 Groote Kerk Buildings, Parliament Street, Cape Town. Telephones: Residence: 6-3024. Rooms: 3-1322.

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## REVIEWS OF BOOKS

## INFANT NUTRITION

*Infant Nutrition: Its Physiological Basis.* By F. W. Clements, M.D., D.P.H., D.T.M. (Pp. 246 + vi, with 14 figures. 21s.) Bristol: John Wright and Sons, Limited. 1949.

**Contents:** 1. Some Aspects of Tissue Metabolism. 2. Foetal Nutrition—General Considerations. 3. Foetal Nutrition—Carbohydrate, Protein, Fat and Minerals. 4. Foetal Nutrition—Vitamins. 5. Foetal Nutrition: Summary and Clinical Application. 6. The Chemical and Physical Properties of Human and Cow's Milk. 7. Digestion in the Young Infant. 8. Water Metabolism. 9. Energy Requirements. 10. Requirements of Nutrients. 11. Application of the Principles. 12. Disturbances of Metabolism of Dietetic Origin.

In this concise and useful book the author has gathered together a great deal of information concerning the physiology of the foetus and the infant. This access to scientific information providing a concrete basis for the very important problem of infant feeding should prove of great interest to those concerned.

The text is adequately supplied with summaries, notes on the possible clinical applications of the data given and numerous references for those wishing to investigate the subject still further.

## TUBERCULOSIS

*The Tuberculosis Process: A Conception and a Therapy. A Private Study* by Alfred Leitch, M.B., Ch.B. (Edin.). (Pp. 175. 12s. 6d.) Bristol: John Wright & Sons, Ltd. 1949.

**Contents:** 1. The Conception. 2. The Natural or Spontaneous Cure of Tuberculosis. 3. Chemical Features in the Tuberculous Process. 4. Observations on the Symptomatology of Tuberculosis. 5. The Alimentary Tract in Tuberculosis. 6. The Respiratory Tract in Tuberculosis. 7. Pathological Changes in Tuberculosis. 8. Anomalous Symptoms in Tuberculosis. 9. Sequelae of the Tuberculous Process. 10. General Observations on Tuberculosis. 11. Diagnosis of Tuberculosis. 12. Prognosis in Tuberculosis. 13. A Rational Therapy for Tuberculosis. 14. Illustrative Cases. 15. Appendix: Temperature Charts.

It is difficult to imagine for what type of reader this little book is intended. The writer convinces nobody with any scientific training by the loose terminology in which he advances his theories, by his process of reasoning, nor by the illustrative cases presented in the style of a commencing medical student. The subject is dealt with from the viewpoint of 40 or 50 years ago; accuracy in diagnosis aided by radiology and pathological examination is nowhere in evidence, while the treatment suggested is vaguely outlined in its naked simplicity. The author seems quite unaware of the immense amount of work done on the chemistry of the tubercle bacillus during the last 30 years, and his whole effort reminds one of a Rip van Winkle who has awakened from a 40- or 50-year sleep and now relates the outline of his night-mare dreams.

The flimsy theory of Chapter I becomes accepted proof in Chapter III. What 'seems probable' in Chapter III is a fundamental and accepted fact a few pages later. Looseness of terminology and illogical reasoning add to the reader's discomfiture.

The book is founded upon a conception (*sic*) and four postulates, none of which is subjected to critical analysis, much less scientific proof. Briefly condensed, the theory of the principal postulate is that formaldehyde is 'an intermediate substance in the normal carbohydrate catabolism' and that as 'an anti-enzyme' it 'makes normal tissue an unsuitable medium for the tubercle bacillus', but that 'when tuberculosis is present, this anti-enzyme is assisted by a further supply of formaldehyde derived from the breaking down of bacterial waste products'.

Since neither the theory nor its application can, in the light of our present knowledge, stand examination by critical scientific methods, the value of this book as a serious contribution is nebulous.

## ANIMAL DISEASES IN SOUTH AFRICA

*Animal Diseases in South Africa.* By Prof. M. W. Henning, M.R.C.V.S., D.Sc. (Pp. 871 + xiii, with various illustrations. £3 5s. 0d.) South Africa: Central News Agency, Limited. Second edition. 1949.

**Contents:** 1. Bacterial Diseases. 2. Protozoal Diseases. 3. Diseases Caused by Viruses and Rickettsias.

The appearance of a second edition of Professor Henning's book will be welcomed by the veterinary profession in this country. It should be particularly useful to the overseas graduate in veterinary science and to those medical practitioners who practise in districts where veterinarians are not available.

Large sections of the book have been completely rewritten, and the section dealing with plant poisons omitted. A number of diseases not included in the first edition is described, and of those of particular interest are the chapters describing *Lumpy-skin Disease* and *Infectious Infertility of Cattle*. Each disease is not only fully described, but is also well illustrated with photographs which are well produced. The more commonly used forms of treatment for each disease are given.

Where a disease is transmissible to man, the author has included a short section giving the latest forms of treatment in man. A large number of references is given at the end of each chapter.

The book is very well produced, only one possible misprint being noticed. The text on page 98 states that 'There is apparently very little difference in the reliability of the subcutaneous and intradermal tests' (for tuberculosis); this should read 'in the reliability of the single and double intradermal tests'.

The author is to be congratulated on producing an outstanding book which should be extremely useful to all those interested in the diseases of the domestic animals of this country.

## PSYCHOSOMATIC MEDICINE

*Psychosomatic Medicine.* By Edward Weiss, M.D., and O. Spurgeon English, M.D. (Pp. 803 + xxx. £4 0s. 9d.) Philadelphia and London: W. B. Saunders Company. Second edition. 1949.

**Contents:** 1. Psychosomatic Medicine. 2. Personality Development and Psychopathology. 3. Psychosomatic Diagnosis. 4. Treatment—General Principles of Psychotherapy. 5. Treatment—'Normal' Problems in Psychotherapy. 6. Treatment—Special Psychotherapeutic Procedures. 7. Training in Psychosomatic Medicine. 8. The Cardiovascular System. 9. The Cardiovascular System—Emotional Factors in Organic Heart Disease. 10. The Cardiovascular System—Essential Hypertension. 11. The Gastrointestinal System. 12. The Gastrointestinal System (Contd.). 13. The Gastrointestinal System (Contd.). 14. Endocrine System and Metabolism. 15. Endocrine System and Metabolism (Contd.). 16. Endocrine System and Metabolism (Contd.). 17. The Genito-Urinary System and the Sexual Function. 18. The Genito-Urinary System and the Sexual Function. 19. The Respiratory System. 20. The Respiratory System (Contd.). 21. The Central Nervous System. 22. Ear and Eye. 23. Skin Disorders and Allergies. 24. Dentistry, Arthritis and Orthopedic Problems.

Psychosomatic medicine is nothing new, as so many would have us believe. Hippocrates wrote that 'in order to cure the human body it is necessary to have a knowledge of the whole of things'. The thoughtful physician has never neglected to consider the patient as a whole, the human being as well as 'the case'. Yet we cannot deny that the personal side of medicine is being sadly neglected—probably the most neglected aspect of medical practice to-day; and the cost is immeasurably great and tragic. The disregard of this vital approach in practice can be attributed to two or perhaps three causes:

(a) A lack of interest in, and sympathy with, persons; and  
(b) The faith of the half-ignorant in reports from laboratories, synonymous to him with 'scientific medicine';

(c) The third cause can be said to be the hurried tempo of practice these days. To get to know the personality of the patient and his reaction to the life situation, and even to his organic illness, needs time for confidential talk with the



patient, often many talks. It is much more commonly owing to such reasons than to the scientific difficulties of psychosomatic problems that these are not tackled.

Weiss and English's *Psychosomatic Medicine* is a book for every student's and every practitioner's shelf. The authors point out quite correctly that a great deal of this aspect of medicine is within the compass of the ordinary practitioner, and within his capacity. The first portion of the book (which deals with the subject of the personality and the emotions in general terms), although admirable on the whole, does not read easily in certain chapters. The reader should not be discouraged by these. The second half of the book, dealing with symptoms as they occur in the different systems, and with actual cases and their interpretation, will show that this subject is not really shrouded in mystery in the majority of cases. The real difficulty is not usually the diagnosis of the psychical trouble; it is the treatment: what to say, how to say it, and when.

#### CLINICAL PERIMETRY

*An Introduction to Clinical Perimetry.* By H. M. Traquair, M.D., F.R.C.S. (Ed.). (Pp. 332 + xv, with 257 illustrations and five coloured plates. 42s.) London: Henry Kimpton. Sixth edition. 1949.

**Contents:** Part I. 1. The Normal Field of Vision. 2. Perimetric Instruments. 3. Methods of Examination. 4. Physiology of the Visual Field in relation to Clinical Perimetry. Part II. 5. The Pathological Field. 6. Interpretations of changes in the Visual Fields. 7. Choroid and Retina. 8. Glaucoma. 9. Optic Nerve. 10. Chiasma. 11. Suprachiasmatic Path and Visual Cortex. 12. Functional Changes in the Field of Vision. Appendix.

Though this book is well known to most ophthalmologists, it has a wide appeal also to everyone interested in neurological problems. As Mr. Norman Dott points out in his foreword to the sixth edition, 'Pathological changes in the visual fields are as important to the neurological and neuro-surgeon as those of the knee jerk or plantar response or the fundus oculi. If they are not thoroughly familiar with the practice and interpretation of perimetry, they are completely equipped for their work.'

The author's concept of the visual field as a hill of vision surrounded by a sea of blindness, is an original one, and it is on this concept that he bases this clinical perimetry. One cannot agree, however, with the author's contention that a 1 mm. object used at 2 metres on a Bjerrum screen is useful except in exceptional circumstances.

The chapter on *Methods of Examination* is extremely lucid, especially to the uninitiated, and pathological field defects are discussed serially from the fundus oculi to the occipital cortex.

There is an excellent bibliography at the end of the book for those interested in further reading.

This volume is a 'must' for every ophthalmologist and is warmly recommended to everyone interested in neurology.

#### APPLIED CARDIAC AND PULMONARY PHYSIOLOGY

*Physiology in Diseases of the Heart and Lungs.* By M. D. Altschule. (Pp. 368 + xv. 30s.) Oxford University Press, P.O. Box 1141, Cape Town.

**Contents:** 1. Chronic Cardiac Decompensation. 2. Acute Pulmonary Edema. Cardiac Asthma. 3. Angina Pectoris. Myocardial Infarction. 4. Cardiac Arrhythmias. 5. Pericarditis. 6. Congenital and Acquired Cardiac Defects. 7. Pulmonary Fibrosis. 8. Chronic Pulmonary Emphysema. 9. Bronchial Asthma. 10. Pleural Effusion. 11. Pneumothorax. 12. Pneumonia.

This is an unusual medical book. The author, having devoted himself to a discussion of some of the physiology of heart and lung action, has then applied this information to the problems which beset the clinician. As his purpose is to explain the physiological causes of clinical conditions, he substantiates the accepted views by drawing on a wide field of literature. Every reference is recorded in the bibliography at the end of each section. Emphasis is laid on the fact that this book has been designed as a 'review of data included in scientific papers and not of the conclusions derived from them'.

The first part of the book comprises discussions on subjects

such as cardiac output, circulation time, peripheral circulation, arterial pressures, right auricular and right ventricular pressure.

The chapter on chronic cardiac decompensation ends with the view that 'the fundamental defect is a cardiac output which in relation to the metabolic requirements of the body and to the venous return, is abnormally low'.

In the chapter dealing with cardiac asthma, the cardiac output, circulation time, the venous and arterial pressures and the blood chemistry are discussed. Interesting views follow on the nocturnal onset of the condition as well as the presence of wheezing. Methods of treatment and their indications are described subsequently. Every statement has some reference to substantiate it.

Similarly there are chapters on arrhythmias, pericarditis and congenital defects.

The section dealing with lung conditions is shorter than the cardiac section. Several clinical conditions are discussed, such as pulmonary fibrosis, bronchial asthma, pneumothorax and pneumonia. Here again each chapter is a collection of clinical and experimental facts. Indications of reason for the occurrence of the symptoms and suggestions about the methods of treatment are given.

In the preface, the author states that this book was written at the request of a number of third and fourth year students. It may prove helpful to students about to commence their clinical work, but it is more likely to be of great interest to the senior worker, the post-graduate student, and the teacher of medicine. It is a systematic and critical review of available physiological studies of diseases of the heart and lungs.

#### BIGGER'S BACTERIOLOGY

*Handbook of Bacteriology.* By Joseph W. Bigger, M.D., Sc.D. (Dublin), F.R.C.P. (London), F.R.C.P.I., D.P.H., M.R.I.A. (Pp. 547 + xv, with 109 figures. 20s.) London: Baillière, Tindall & Cox. Sixth edition. 1949.

**Contents:** 1. Introduction. 2. Microscopic Examination of Bacteria. 3. Sterilisation. 4. The Preparation and Use of Culture Media. 5. The Making of Cultures. 6. Special Technique. 7. Serological Technique. 8. The Obtaining of Material from the Patient for Bacteriological Examination. 9. The Identification of Pathogenic Bacteria. 10. Antiseptics, Chemotherapy, Antibiotics. 11. Practical Methods in Connection with Antibiotics. 12. Bacteriology of Water, Milk and Shellfish. 13. Bacteria in Health and Disease. 14. Introduction to Immunity. 15. Antigens and Antibodies. 16. Phagocytosis. 17. Toxins and Antitoxins. 18. Precipitation and Agglutination. 19. The Killing and Dissolving of Bacteria and other Cells. 20. Hypersensitivity. 21. The Classification of Bacteria. 22. Staphylococci. 23. Streptococci. 24. *Diplococcus pneumoniae*. 25. *Neisseria meningitidis*. 26. *Neisseria gonorrhoeae*. 27. *Bacillus anthracis*. 28. *Corynebacterium diphtheriae*. 29. Coliform Bacteria. 30. Salmonellae. 31. Enteric Fever. 32. Bacillary Dysentery. 33. Miscellaneous Bacteria. 34. *Vibrio cholerae*. 35. *Pasteurella*. 36. Haemophilic Bacteria. 37. Bacteria causing Undulant Fever. 38. The Tubercle Bacillus. 39. *Mycobacterium leprae*. 40. *Malleomyces mallei*. 41. Spirochaetes. 42. Toxin Producing Clostridia. 43. Anaerobic Bacteria of Wounds. 44. Actinomycosis. 45. Viruses and Rickettsiae. 46. Pathogenic Protozoa. 47. Pathogenic Fungi. 48. Formulae.

This popular handbook has been thoroughly revised and brought up to date. Two full chapters are now devoted to penicillin and the sulphonamides, and the sections on the viruses and rickettsiae have been greatly increased. Two new chapters have been added to the book, and 11 have been rewritten, including five on immunity, three on intestinal bacteria and one on undulant fever.

Although the nomenclature in general conforms with that given in Bergey's *Manual of Determinative Bacteriology*, the author has reserved the right on occasions to retain familiar names on the grounds of priority. Thus the name *Staphylococcus* is preferred to *Micrococcus*.

The book is primarily intended for medical students and not for bacteriologists, although the latter will find it a useful work of reference. The fact that it was first written in 1925, and has now reached its sixth edition, with six reprints during the past 25 years, is a testimony to its popularity.

The illustrations are good, and the paper and general production are excellent. The author is to be congratulated on a successful revision of a justly popular handbook.

## ANDERSON'S PATHOLOGY

*Pathology.* Edited by W. A. D. Anderson, M.A., M.D., F.A.C.P. (Pp. 1453 + xii, with 1183 illustrations and 10 colour plates. £5 1s. 3d.). St. Louis: The C. V. Mosby Co. 1948.

*Contents:* 1. Introduction (Paul Klemperer); 2. Cells and Their Behaviour (E. V. Cowdry); 3. Inflammation (Morton McCutcheon); 4. Degenerative Changes and Disturbances of Metabolism (W. A. D. Anderson); 5. Disturbances of Circulation (Virgil H. Moon); 6. Physical Agents in the Causation of Injury and Disease (Alan R. Moritz); 7. Chemical Injury (Walter W. Jetter); 8. Effects of Radiation (Charles E. Dunlap); 9. General Principles of Infection and Resistance (Paul R. Cannon); 10. Bacterial Diseases (Howard C. Hoppes); 11. Tuberculosis (Francis D. Gunn); 12. Tuberculous Conditions (W. A. D. Anderson); 13. Leprosy (Enrique Koppisch); 14. Spirochetal and Venereal Diseases (Edgar R. Pund); 15. Rickettsial and Viral Diseases (Henry Pinkerton); 16. Fungus Infections (Roger D. Baker); 17. Protozoal and Helminthic Infections (Enrique Koppisch); 18. Vitamins and Deficiency Diseases (Henry Pinkerton); 19. Neoplasms (Shields Warren); 20. The Heart (Ernest M. Hall); 21. The Blood and Lymphatic Vessels (Ernest M. Hall); 22. The Kidneys (W. A. D. Anderson); 23. The Lower Urinary Tract and Male Genitalia (S. B. Pessin); 24. The Lung (Francis D. Gunn); 25. The Organs of Special Senses (J. E. Ash); 26. The Lips, Mouth, and Teeth (William H. Bauer); 27. The Gastro-intestinal Tract (John R. Schenken and Edward L. Burns); 28. The Liver (W. A. D. Anderson); 29. The Gallbladder and Bile Ducts (Bela Halpert); 30. The Pancreas (W. A. D. Anderson); 31. Diabetes Mellitus (Shields Warren); 32. The Blood and Bone Marrow (Maurice N. Richter); 33. The Spleen, Lymph Nodes, and Reticulo-endothelial System (Maurice N. Richter); 34. The Thymus (W. A. D. Anderson); 35. The Pituitary Gland (Hypophysis) (John E. Kraus and W. A. D. Anderson); 36. The Pineal (W. A. D. Anderson); 37. The Thyroid (W. A. D. Anderson); 38. The Parathyroids (W. A. D. Anderson); 39. The Adrenals (W. A. D. Anderson); 40. The Female Genitalia (Walter Schiller); 41. The Breast (Joseph H. Kuzma and Helen Ingelby); 42. The Skin (Arthur C. Allen); 43. The Bones (Granville A. Bennett); 44. The Joints (Granville A. Bennett); 45. The Nervous System (Jeff Minckler); 46. Heredity and Constitution in Disease (Madge T. Macklin).

There is no lack of variety in the supply of textbooks for the student of pathology, but there are very few indeed which qualify for unreserved recommendation to the students. Anderson's textbook is in this class. Not only is the textual matter most impeccable, but the photomicrographs and other illustrations represent a very fine achievement. The colour plates are reasonably true and, from the technical point of view, the book is an excellent contribution as well.

Particularly comprehensive is Virgil H. Moon's chapter on *Disturbances of Circulation*, an account which forms the basis for an understanding of shock and related capillary phenomena.

The chapters by Moritz (*Physical Agents in the Causation of Injury and Disease*) and Jetter (*Chemical Injury*) are a valuable fund of information for the practitioner as well as the undergraduate student.

A pleasant feature of this extraordinarily comprehensive compendium by a great number of expert authors is the adequate attention paid to every conceivable aspect of the subject. For this reason the volume is invaluable not only to general practitioners, but also to specialists such as gynaecologists, dermatologists and surgeons, as well as the undergraduate student for whom it was prepared.

## EASY CHILDBIRTH

*Relaxation and Exercise for Natural Childbirth.* By Helen Heardman. (Pp. 32, with 22 figures. 9d.) Edinburgh: E. & S. Livingstone Ltd. 1950.

In this excellent booklet, an attempt is made to satisfy the enquiries of expectant parents who will welcome this compact, cheap and not overburdened résumé on the art of relaxation and exercises for natural childbirth.

Mrs. Heardman (herself holding the teacher's certificate in physiotherapy) has based these exercises on the well-known principles of Dr. Grantley Dick Read.

Technical language has been skillfully avoided, making reading easy for the layman, with lucidly set out illustrations and diagrams. As Mrs. Heardman emphasizes, many of the exercises can be fitted in with 'other things which you are

doing', making life more interesting during the 'carrying period'.

Deep breathing and relaxation are the keynotes of this compact edition on the preparation for the natural phenomenon of childbirth.

Mothers-to-be should make every attempt to read this booklet on how to practice to produce 'painlessly', which should enjoy the widest possible circulation.

## HORMONES IN CLINICAL PRACTICE

*Hormones in Clinical Practice.* By H. E. Nieburgs, M.D. (Pp. 388, with 57 figures. 25s.) London: Cassell & Company Ltd. 1949.

*Contents:* 1. Anterior Pituitary Hormones. 2. Posterior Pituitary Hormones. 3. Thyroid Hormone. 4. Parathyroid Hormone. 5. The Suprarenal Gland Hormones. 6. The Islet System of the Pancreas. 7. Oestrogens. 8. Progestogens. 9. Androgens. 10. The Pineal and Thymus. 11. Environmental Influences on Glandular Function. 12. Psycho-somatic Endocrinology. 13. Non-Hormonal Substances for the Treatment of Endocrine Disorders. 14. Vitamin-Endocrine Relationships. 15. Diagnostic Procedures. 16. Commercial Preparations. Index.

This is not another text book on the endocrine organs. It is a relatively recent survey of the advances in our knowledge of the interglandular relations with detailed accounts of the scope and method of treatment with the hormones now available.

The author has attempted to provide general practitioners with a guide to the conditions for which hormone therapy is necessary or desirable. The choice of preparations and their mode of administration can be puzzling, and here the answer is available in simple and easy-to-follow terms.

The physiology of each gland and its inter-relations is clearly set out and this conveys to the reader more than anything else how complex treatment can be when the balance of the endocrine system is upset. The clinical conditions associated with various diseases are listed and the appropriate treatment is then suggested. Unfortunately it does not follow that cures will be obtained, and it is still a valid criticism of this vast subject that so many pathological conditions do not respond no matter how scientifically they may be treated. The fact that many preparations are inert in the human frame often leads to disappointments. The treatment is on the whole good and one does not wish to criticise too severely.

However, one does note that the treatment of acne with insulin is mentioned but not that with the oestrogens. The latter can be invaluable in chronic cases; insulin is valueless.

There is an excellent bibliography, and the list of preparations, British and American, is a valuable aid to the physician. This book is well worth having.

## ANAESTHESIA

*Fundamental Considerations in Anaesthesia.* By Charles L. Burstein, M.D. (Pp. 153 + x with 64 illustrations. 30s.) London: Messrs. Macmillan & Company Limited. 1949.

*Contents:* 1. The Autonomic Nervous System. 2. The Respiratory Pattern during the General Anaesthesia. 3. Respiratory Disturbances: A. 4. Respiratory Disturbances: B. 5. Laryngeal Spasm. 6. Circulatory Disturbances: A. 7. Circulatory Disturbances: B. 8. Circulatory Disturbances: C. 9. Circulatory Disturbances: D. 10. Circulatory Disturbances: E. 11. Parasympathetic Reactions: A. 12. Parasympathetic Reactions: B. 13. Parasympathetic Reactions: C. 14. Gastrointestinal Autonomic Reactions. 15. Pulmonary Control.

This is a well-presented monograph which makes very enjoyable reading. It abounds with the wisdom of one who is obviously as well acquainted with the laboratory as with the practice of clinical anaesthesia.

The little work deals with the application of physiology and pharmacology to the practice of modern anaesthesia; for, as the author wisely remarks in his preface: 'It is hoped that such knowledge will help to dispel the fear with which the technician anaesthetist is often possessed . . . and to know how to prevent complications before they occur, and to know how to treat them when they become manifest.'

One is impressed by the manner in which the author simpli-

fies the various physiological and pharmacological problems the clinical anaesthetist is confronted with daily. This is particularly evident in the various chapters on circulatory and respiratory disturbances and in the chapter on laryngeal spasm. In the latter chapter, however, the reviewer finds it difficult to accept two of the remedial measures advocated: the application of 10% cocaine to the glottis during an attack of laryngospasm, and the necessity of having to perform tracheotomy for this complication.

One cannot but agree with the author in condemning the 'Application of Heat' and the use of vasoconstrictors and analeptics in the treatment of shock. It is doubtful, though, whether haemoconcentration determination is a useful practical aid in diagnosing impending shock during anaesthesia.

In the discussion on the choice of an anaesthetic agent in shock one finds oneself at variance with the author's preference for cyclopropane. True, cyclopropane has cardiotonic properties and it does maintain certain compensatory reflexes but only during light anaesthesia, like most other anaesthetic drugs.

This little monograph is obviously not intended to replace the larger works on applied physiology and pharmacology. It is unique, however, in the manner in which the author treats these basic sciences in particular relation to modern anaesthesia.

#### PROCTALGIA

*Treatment in Proctology.* By Robert Turell, B.S., M.D., with a chapter on Psychosomatic Problems by Louis Linn, M.D. (Pp. 248 + xiv, with 85 illustrations. 54s.) London: Baillière, Tindall & Cox. 1949.

**Contents:** 1. Sulfonamide and Antibiotic Therapy. 2. General Agents and Procedures. 3. Anaesthesia. 4. Polyps. 5. Malignant Lesions. 6. Inflammation and Infection. 7. Diverticulosis and Diverticulitis. 8. Pruritus Ani. 9. Hemorrhoids. 10. Prolapse. 11. Diarrhoea. 12. Venereal Diseases. 13. Traumatic Wounds. 14. Miscellaneous Disorders. 15. Pilonidal (Sacrococcygeal) Cyst and Sinus. 16. Proctology in Pediatrics. 17. Proctology in Geriatrics. 18. Diets. 19. Psychosomatic Problems in Proctology. 20. Summary of Drugs. 21. Armamentarium.

The patient reviewer of medical textbooks must often ask himself what prompts medical publishers to bring out new books. Best-sellers in this field must be excessively rare. Perhaps this is why publishers insure themselves against loss by fixing fantastic prices for their books. Look at the bookshelves of any doctor and you will find a selection of expensively bound tomes—none of them costing less than £2 to £3 and many of them more. They are not out of date by the time they are published and those which have value as works of reference are as alike as two peas. There ought to be a law forbidding the production of textbooks unless the author has something new to say.

The present reviewer is driven to this conclusion from a study of *Treatment in Proctology*. For the life of him he cannot understand why this book was written or, having been written, why it was published. If it is meant to help the family doctor in handling cases of pruritus, haemorrhoids, fissure, fistula, etc., then it is far too scrappy to be of real assistance. If it is designed to enlighten practitioners whose work is confined to this field then it is a woeful achievement. It adds nothing to and lags far behind the works of Gabriel, Miles, Buie, Yeomans, Hirschmann and Bacon.

In his introduction the author promises that the operations for benign and neoplastic colonic lesions will be described in detail. The whole subject is covered in 24 pages whilst 20 pages are devoted to sample menus in various dietetic regimes.

There is a pretensions chapter on psychosomatic problems in proctology which is about as helpful to the reader in search of light as an attack of proctalgia.

The nearest approach to novelty in this opus is a description of the author's treatment of pruritus ani by electric tattooing with mercuric sulphide. This is best given in the author's own words:—

'The equipment consists either of an electric tattooing machine or of a pneumatic tattooing pistol with needle handles containing 10 to 20 needles oscillating at a speed of from 3,000 to 7,000 vertical movements per minute . . . any form of anaesthesia that will last for 1 hour is satisfactory.'

With fine unconscious irony he adds: 'There is no indication for further therapy and none is desired by the patient.'

This reviewer has often longed passionately for some method which would induce patients with pruritus to go to his colleagues. Here at last would appear to be the answer to his prayers—the pneumatic tattooing pistol with 20 needles making 7,000 vertical movements per minute!

#### SUBDURAL HAEMATOMA

*Das Intrakranielle Subdurale Hämatom.* By H. Krayenbühl and G. G. Noto. (Pp. 175, with 31 illustrations. Fr. 18.50.) Bern: Medizinischer Verlag Hans Huber. 1949.

**Contents:** 1. Introduction. 2. Structure and Function of the Dura Mater. 3. The Traumatic Acute Subdural Haemorrhage. 4. The Chronic Subdural Haemorrhage. 5. Diagnostic Methods. 6. Differential Diagnosis. 7. Treatment of the Chronic Subdural Haemorrhage. 8. Conclusions Regarding Insurance Cases.

This book by the leading Swiss neuro-surgeon and his co-worker fills a definite gap in the neuro-surgical literature.

The author deals briefly with the rather conflicting opinions regarding the aetiology and the nomenclature of subdural haematomas. He logically divides the subdural haematomas into two main groups. The first group comprises those cases of subdural haemorrhage which are the result of known head trauma. In the second big group he places those cases in which the subdural haemorrhage occurs without any evident head trauma. This latter group comprises what the pathologist Virchow first described as pachymeningitis haemorrhagica interna. The author rightly stresses that more important than the theoretical discussion of the cause of subdural haematoma, is the fact that, whatever the underlying pathology, it forms a clinical entity which can and should be diagnosed. When the diagnosis has been made, the only correct treatment is surgical intervention.

The major part of the book deals with a description of 50 cases of subdural haemorrhage observed and treated in the authors' clinic. These cases are described in great detail as regards history, neurological findings, operative treatment and end results. Reading through these protocols it strikes one, that among the numerous cases with bilateral subdural haematomas, the majority were only opened on the side suggested by the clinical symptoms or ventricular shift. Only on non-recovery was the other side explored at a later date. This fact is rather surprising, as it is an accepted fact by the majority of neuro-surgeons that every subdural haematoma must be explored on both sides as a matter of principle.

Attention is also drawn to the fact that, apart from the absolute indication of surgical intervention in the case of a chronic subdural haematoma, the acute subdural haematoma can sometimes present a very similar picture to an epidural haematoma and should be treated surgically.

The book has some good reproductions of ventriculograms performed on cases of subdural haematomas, showing the varied displacements which can be encountered. Diagnosis of this condition with the aid of arteriograms and electroencephalograms is also dealt with.

In the last chapter the surgical procedure, as performed in the authors' clinic, for both acute and chronic haematomas, is described adequately.

The book covers in detail the important subject of subdural haematomas. It will not only be an asset to the neuro-surgeon and the neurologist, but also to the general surgeon who has to deal with traumatic head injuries. At the moment, however, it will be confined to those who can read it in the original language as an English translation is not available.

#### A GLOBAL STUDY OF TUBERCULOSIS

*Tuberculosis: A Global Study in Social Pathology.* Dr. John B. McDougall, C.B.E., M.D., F.R.C.P. (Edin.), F.R.F.P.S. (Glas.), F.R.S.E. (Pp. 442 + viii. 32s. 6d.) Edinburgh: E. & S. Livingstone, Limited. 1949.

**Contents:** 1. Introduction. 2. Some General Considerations Influencing Morbidity and Mortality Rates From Tuberculosis—A Summary of Prevailing Views. 3. Investigating the Tuberculosis Problem in a Community—with Commentaries. 4. Evaluating the Problem.

Here we have, within the covers of a simple volume, the most up-to-date exposition of the tuberculosis problem regarded impartially from the widest possible angle. Dr. McDougall



writes as member of the Section of Tuberculosis of the World Health Organisation, and is in a unique position to collate and sift the world-wide enquiries which have been made. All the latest and most relevant information on infection, morbidity and mortality from tuberculosis has been presented, as well as the factors usually considered to have a bearing on the extent and severity of the problem in communities.

A strong plea is entered for the adoption of some standardized form of recording, since it is obvious that international comparisons become possible only when comparable information is available on many important aspects of the disease. In spite of these difficulties, the author has produced a most interesting and intriguing treatise, and his masterly summaries of world scientific opinion on such matters as Native and Acquired Resistance, the Downward Trend of Mortality and the Infecting Dose, besides many other phases of the problem, will immediately be appreciated by the reader.

In his Mortality Survey all countries of the world are briefly reviewed, and the peculiar problems of each duly recorded. Our own difficulties in South Africa are fully appreciated, and a very favourable reference made to the activities of Mr. Paul Sykes' F.O.S.A. organization.

Part III deals with the investigation of the tuberculosis problem in a community and is a splendid commentary on every phase of the work as seen in the light of up-to-date experience in all countries.

This is a book no administrator or worker in this field can afford to do without. It presents a carefully considered opinion and is, indeed, the last word on the present conception of this many-faceted problem.

The publishers have well maintained their usual high quality in printing and presentation.

## CORRESPONDENCE

### CRIMINAL ABORTION AND ITS PENALTIES

*To the Editor:* I want to congratulate Dr. Fismer for having brought the question of *Criminal Abortion and its Penalties* to your notice in the 13 May issue of our *Journal*. Since January of this year I have kept a little list of news items in this connexion taken mainly from the local evening newspaper. Here it is:—

1. *January.* Two women sentenced in Cape Town on numerous counts. *Suspended sentences.*
2. *February.* Two women sentenced in Cape Town on several counts. *Suspended fines in both cases.*
3. *March.* (a) European male found guilty of abortion—four months hard labour.  
(b) Doctor for trial. Bail £100 (four counts).  
(c) Woman fined £40 (at Wynberg) two months *suspended*.  
(d) Rand doctor for trial.
4. *April.* (a) Penalty was too harsh; judges reduced the sentence. See (a) above.  
(b) Woman sentenced, *suspended sentence*.  
(c) Two committed for trial. Bail £25 each.  
(d) Women sent to jail. One month on each of two counts; the balance was *suspended*.

Must we now accept it as a fact that the law is condoning criminal abortion on the grounds mentioned by the two learned judges? Is it not possible that this question of criminal abortion could be brought to the notice of the Minister of Justice by our Association and the Medical Council?

From one's experience of the number of young women who come for assistance and/or guidance, and who do not become mothers, one feels compelled to say that criminal abortion seems to be quite freely practised by very many people in this country and one feels further that it is high time that something drastic should be done about it.

Louis L. Nel.

140, Voortrekker Road,  
Goodwood.  
14 May 1950.

### FREE CHOICE OF DOCTOR

*To the Editor:* Enclosed you will find my cheque for my subscription for the current year. The delay was caused by

considerations whether it is worth to belong to the Association or not. I give you in the following lines my reasons for that.

I take it the Association is there in the first place not for research or scientific purposes, but in order to protect the economic interests of the profession and to further these. I think the Association has not been very successful in doing so during the seven years I have belonged to it. On the positive side are the negotiations with the so-called friendly societies (approved Medical Aid Societies) and with the Life Insurance Companies. But the Association failed completely with regard to the so-called Sick Funds of the Leather Union, the Garment Workers' Union, the Tramway Company Sick Fund and so on.

The system prevailing in the Sick Funds is completely out of date. The closed panel system is a threat to the medical profession as a whole. If it goes on, it will happen in the near future that nearly the whole working class is included and provided for by perhaps 10% of the profession. The other 90% can look for other work. That system was the rule on the Continent of Europe in the years 1885 to approximately 1914, i.e. when social legislation started. The different medical associations of the different countries saw very quickly the danger and fought with all their power against the vested interest of a small number of doctors, Union Secretaries and Union bosses, and brought it quickly to a victorious end. That meant free choice of doctors.

By a lucky chance I got hold of the rules and regulations of the Garment and Clothing Workers Sick Fund before it started. I brought it to the chairman of the Medical Association Committee which was dealing with these affairs but was told nothing could be done. If that is the attitude the Association takes, then it would be best to close the universities in the Union and send yearly 100 students to England for study. That would be more than enough doctors. It is incredible that in the year 1950 people should be forced to belong to a Sick Fund, to pay their contributions, but not to have their right to choose the doctor they want and trust. I want to tell you that I do not speak *pro domo*, as I have no patients of these classes of workers. I would be interested to hear what you are going to do in that matter. That the Association can do something was clearly shown in the hospital affair in Transvaal.

Hugo Baum.

Cape Town,  
24 May 1950.

### USE OF ANTIBIOTICS

*To the Editor:* The introduction of the wide antibacterial-range antibiotic Terramycin might encourage the indiscriminate use of an, at present, expensive medicament in conditions in which its use does not appear to be valid.

In a clinical trial at the Mayo Clinic it was found ineffective in a case of shingles, yet a brochure put out by a local distributing house claimed shingles as one of the indications for its use.

It would appear that therapeutic caution on the part of the profession is desirable and that they must resist the attempt of 'advertising matter' to usurp the function, and protection, of reputable medical journals.

M. Glass.

26 May 1950.

### ALCOHOL, DISEASE AND THE BANTU

*To the Editor:* The *Journal* of 20 May 1950 contains an article entitled *Alcohol—a Public Health Problem* by Dr. Basil Sampson, on which I would like to make a few comments.

Has Dr. Sampson any proof, or could he give any facts to show that alcohol *per se* is more toxic to the Bantu as compared to the rest of the community. Without such facts I feel the article would be inaccurate; also without such facts it would appear that Dr. Sampson's conclusions about the relation of alcohol to disease in the Natal Bantu are based on personal observations and since such conclusions include a comparison of the incidence of certain diseases in a racial group differing from the rest of the community, in ways known to affect the incidence of disease, it would seem unfair to attach so much importance to alcohol as a single factor.

One needs no figures to show that the consumption of

intoxicating liquor is higher among the Europeans than the Bantu of this country. In addition, the type of liquor consumed by the Europeans is more potent in alcoholic content than that used by the Bantu, with the exception of such drinks such as *skokiaan*, *mankontjaan*, *skomfaan*, *barberton*. What leads Dr. Sampson to think that alcohol plays such a big role in the production of disease in the Bantu, who, on the whole, consume so much less alcohol per person than the other sections of the people? Even if the production of *shimeyaan* or *gabeen* is very high in Durban, I cannot conceive that it equals the amount produced by the legalized big brewing and distilling firms.

Exactly why is the incidence of tuberculosis lower in countries where no restrictions are placed on the production or consumption of alcohol as compared to South Africa, where the Bantu have access to a very limited amount of alcohol.

On what scientific facts does Dr. Sampson base the statement that the major attraction of the Bantu from the Reserves is alcohol. Dr. Sampson states: 'When once a Native has experienced the intoxicating effect of either *shimiyane* or *gabeen*, he may return to the farm for a while, but it will not be for long.' Surely, if *shimiyane* and *gabeen* constitute the attraction, the Bantu people could brew this drink on the farms or at their kraals where they would not be molested by police raids. Why should they go to the towns to get something which they can make freely and unmolested in the Reserves?

Further on Dr. Sampson says that improved sanitation and housing would not ameliorate the state of the people living in the shacks he describes. As a mere medical student it might be that I am unable to understand such involved, philosophical cerebration as would lead me to see the logic in such a statement. With this exception, I would say that it seems most unacceptable to medical science to draw such conclusions with the certainty and confidence which Dr. Sampson displays, on a statement open to so much argument.

May I ask Dr. Sampson why tuberculosis, for instance, is highest in slum areas and among the poorer classes, irrespective of the alcohol consumption? Why is it that in the towns of Europe, America, England, the incidence is so high in the 'Casbahs' where *shimiyane* and *gabeen* are not known, and other liquors are used to no greater extent than that used by the rest of the population? The answer is simple. The lower classes, irrespective of race, live under unhygienic conditions and their low wages force them to live on inadequate diets. I hope Dr. Sampson will see the error he has made by using arguments of this type in an article which may be of great importance to all medical men.

*Amoebic Dysentery*: Does Dr. Sampson really believe that he is correct in stating: 'The incidence of the fulminating type of acute amoebic dysentery among Bantu adults, especially men, is intimately connected with the consumption of alcohol?' I agree that any factor lowering the resistance would precipitate an exacerbation of an otherwise latent condition, but I have much doubt whether alcohol is more debilitating than malnutrition, overcrowding and bad hygiene.

May I refer to a letter in the *Journal* of 4 March 1950 by Dr. R. Elsdon-Dew, on the relative incidence of amoebic dysentery in the Durban Bantu as compared to the Lourenço Marques Bantu. Of 121 hospital cases in Lourenço Marques (Bantu) 2% had *Entamoeba histolytica* in their stools, whereas in a Durban Hospital (Bantu) 28% had *E. histolytica* in their stools. Dr. Elsdon-Dew observed the different living conditions of the Lourenço Marques Bantu as compared to the Durban Bantu, and found that though sanitation was not what it should be for a modern city such as Lourenço Marques, 'in general they had no "Cato Manor" conditions'. Dr. Elsdon-Dew also mentions that the diet of the Lourenço Marques Bantu is more nutritive than the maize diet of the Bantu of the Union towns. Further, Dr. Elsdon-Dew also points out that the incidence of tuberculosis and typhoid fever is low among the Lourenço Marques Bantu. The letter by Dr. Elsdon-Dew is based on facts and figures and not on personal observation.

Referring to money spent on alcohol by the Bantu, could Dr. Sampson disagree on the fact that the Europeans spend more money on alcohol than the Bantu? If so, why should alcohol be blamed for the small sum of money sent home by Bantu men working in the Towns. Would it not be fairer

to say that if these people were paid more they could have more to send home after buying a bit of *shimiyane*, which, after all, they deserve as a human right. Dr. Sampson clearly uses a supposition that the Bantu have no right whatsoever to the consumption of alcohol.

My view is that Dr. Sampson started off with good intentions, but built his article on poor foundations. I agree that alcohol plays a part in the production of disease, but alcohol *per se* plays the same role among other sections of the community as it does amongst the Bantu. I feel it is unscientific to compare the resistance of the Bantu to that of the better-fed and better-housed sections of the population. Housing, sanitation and diet are the factors which medical men should face, and if Dr. Sampson feels that the health of the Bantu is important, he might agree that it is more important to press for efficient sanitation and better housing, instead of moaning about the small size of the police force.

I would welcome further discussion on the points mentioned, and I hope others will also express their opinions and views.

Medical Student.

Cape Town.  
1 June 1950.

#### AN UNDESCRIBED FEVER

*To the Editor*: In reply to Dr. A. A. Gordon's letter of 20 April, I should like to repeat what was implied in my original article, under 'Differential Diagnosis', viz. the condition is not amaas or kaffir-pox. A more careful reading of my article should make the points of differentiation clear. Further, the many medical men who have seen my 'Undescribed Fever' and who, like myself, have considerable experience of amaas, support me unhesitatingly.

L. J. A. Loewenthal,  
M.D., M.R.C.P., D.T.M. & H.  
504 Medical Centre,  
209 Jeppe Street,  
Johannesburg.  
1 June 1950.

#### INTERN GRIEVANCES AGAINST THE MEDICAL COUNCIL

*To the Editor*: I should like to place on record yet another grievance of the intern against the S.A. Medical Council.

On qualifying one pays the sum of £15 to the Council for registration. Less than five months later there is demanded from the intern an additional sum of two pounds (plus threepence bank exchange) for the privilege of being an intern, with whatever status that may now imply. This sum is the same as is paid by fully recognized medical practitioners, and represents to the intern in most hospitals in the Union, the equivalent of almost one week's salary. One feels strongly the injustice of this further demand on the intern at a time when his financial state is so precarious.

'Intern'

6 June 1950.

#### TERRAMYCIN AS SPIROCHAETICIDE

*To the Editor*: I should like to draw your attention to a statement appearing in an advertisement for Terramycin which appeared in the *Journal* of 20 May, page viii. Part of the material reads: 'Studies indicate also that a single large dose is sufficient to reverse the dark-field in a high percentage of individuals infected with syphilis.'

This is an accurate statement of fact, but I feel that it might be misleading and be interpreted by the unwary as implying that a single large dose of Terramycin could cure syphilis. Temporary disappearance of spirochaetes from the dark-field can, of course, follow a single adequate dose of any potent anti-syphilitic remedy such as neoarsphenamine or penicillin, but actual cure requires much more.

If it were stated that preliminary studies in human syphilis indicate that Terramycin has spirochaeticidal properties, there would be no possibility of misapprehension.

James Marshall, M.D.

140 Lister Buildings,  
Jeppe Street,  
Johannesburg.  
8 June 1950.